

ARCHITECTURE AND NARRATIVE

The formation of space and cultural meaning

Sophia Psarra



Architecture and Narrative

Looking at how meaning is constructed in buildings and how it is communicated to the viewer, this intriguing study will be of interest to anyone concerned with architecture and culture; from architects to museum specialists and exhibition designers.

Arrangement of spaces, social relationships and cultural content is fundamental to how buildings are shaped, used and perceived. Narrative enters architecture through the ways in which space is structured to achieve specific effects on our perception. Architects employ conceptual-formal patterns independently from a viewer's experience, but also organize space from the viewpoint of an observer. The act of perceiving is linked with the sequential unfolding of information as our bodies pass through space.

Examining the notions of conceptual, perceptual and social space, *Architecture and Narrative* explores the ways in which these three dimensions interact in the design and life of buildings.

Sophia Psarra is Associate Professor of Architecture at the Alfred Taubman College of Architecture and Urban Planning at the University of Michigan, USA. She has collaborated with leading cultural institutions in the UK and the US on issues of spatial organization, planning of exhibitions and visitor experience.

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Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2009 by Routledge
2 Park Square, Milton Park, Abingdon, OX14 4RN

Simultaneously published in the USA and Canada
by Routledge
270 Madison Avenue, New York, NY10016

Routledge is an imprint of the Taylor & Francis Group, an informa business

This edition published in the Taylor & Francis e-Library, 2009.

“To purchase your own copy of this or any of Taylor & Francis or Routledge’s collection of thousands of eBooks please go to www.eBookstore.tandf.co.uk.”

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data

Architecture and narrative : the formation of space and cultural meaning /
Sophia Psarra.

p. cm.

Includes bibliographical references and index.

1. Architecture—Composition, proportion, etc. 2. Architecture and
society. I. Title.

NA2760.P78 2008

720.1—dc22 2007034037

ISBN 0-203-63967-7 Master e-book ISBN

ISBN10: 0-415-34375-5 (hbk)

ISBN10: 0-415-34376-3 (pbk)

ISBN10: 0-203-63967-7 (ebk)

ISBN13: 978-0-415-34375-6 (hbk)

ISBN13: 978-0-415-34376-3 (pbk)

ISBN13: 978-0-203-63967-2 (ebk)

To Eleni and Panayotis

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Preface

Architecture and Narrative explores the relationship between architecture and cultural meaning. It looks at how architecture and meaning are conceived through abstract relations and how they are perceived through embodied experience. The conceived and perceived notions of space are often cast in architectural theory as a powerful opposition. On one side there is architecture as an orchestration of concepts in the mind, and on the other as a perceptual condition experienced by bodies moving in space. This work argues for a unified approach that can explain the two fields as opposed to the division between mental and physical.

The book is divided into four parts. Part One, Foundations, sets the framework and the intellectual theme that permeates this work through the study of three buildings that foreground their aesthetic and morphological value over the architectural programme. This characteristic enables an inquiry into the spatial construction of cultural meaning separate from the social purposes carried by function. Part Two, Architecture and Narrative in Literature, is an examination of the conceptual and perceptual in literature where the narrative content understandably gains greater significance over the formal codes of language. It explores the literary work of Jorge Luis Borges, and the use of architecture as a model for the theoretical ideas in his fictions. The purpose is to examine how the ordering mechanisms in literature can inform the construction of experience in architecture. Part Three, Spatial and Narrative Interactions, focuses on the interaction between spatial and narrative codes in museums and galleries. It looks at how the spatial layout relates to the conceptual messages of exhibitions and the visitors' experience. Finally, Part Four, Theoretical Synthesis, draws together ideas developed in the individual chapters. It leads to a theoretical discussion about architecture and meaning in the areas of morphological study, historical and theoretical analysis.

The book is the outcome of a long-term engagement with this subject through studio teaching, research and architectural practice. The intention is not just to demonstrate the contribution of morphological analysis to the theoretical discussion of conceived and perceived space, but also to assert the ways in which historical and theoretical knowledge can enrich the morphological study.

Acknowledgements

In this book the reader will encounter my interest in geometrical concepts and my fascination with discovering them in buildings, myth and literature. The ideas in *Architecture and Narrative* emanate from an early classical education. As constants in the modern Greek educational system, Homer and Euclid were for me less the objects of interest in themselves than ways of imagining and ways of thinking, shaping a passion for the irrational workings of poetry and the rational mechanisms of geometry, a passion for contradictions and contrasts.

The mind gravitates towards the patterns it prefers and so my interests were channelled in the university years into architecture. But my studies at the MSc course for Advanced Architectural Studies at the Bartlett University College London opened a new way of looking at buildings beyond geometry and the role it plays in their conception. As a student of Bill Hillier and Julienne Hanson I learned to think about how architecture and space are experienced as social realities. But the emphasis they placed on how spaces are put together to formulate relationships renewed my fascination with the conceptual logic of form by the newly discovered workings of space. My interests in these two areas were met with enthusiasm from John Peponis, then at the Bartlett and now at Georgia Institute of Technology. He encouraged me to embrace explorations that were related to the ways in which architects think. His continuing work in this direction and his analysis of Italo Calvino remain a constant source of inspiration. I would first like to thank Bill, Julienne and John for teaching me new ways of thinking and for their constant emphasis on intellectual inquiry and innovation.

This book was developed as a result of my experience in three countries, Greece, the United Kingdom and the United States, a trajectory that has been unconsciously mapped in its chapters, from the Parthenon and the Erechtheion in Athens, to Soane's Museum in London, four other museum buildings in the UK and, finally, the latest expansion of the Museum of Modern Art, New York (MoMA). The chapters on the Barcelona Pavilion and Borges' fictions form digressions, but are imbued with the ways in which ideas in architecture, literature and art travelled in this direction, from the Mediterranean world to Western Europe and to America. I wish to thank my teachers and my colleagues in the institutions in which I studied and taught in the three countries, especially those in the Taubman College of Architecture and Urban Planning, University of Michigan, and in the Welsh School of Architecture, Cardiff University for their generous support and collegiality. Names are too many to record, but special thanks go to Doug Kelbaugh, former Dean of the Taubman College, and his successor Monica Ponce de Leon, to Jean Wineman, Tom Buresh,

Acknowledgements

Caroline Constant, Lydia Soo and Claire Zimmerman, all colleagues in the Taubman College. I would also like to mention my former colleagues, Phil Jones, Wayne Forster, Richard Weston, Chris Powell, Judi Loach and Sarah Lupton in the Welsh School of Architecture. I am especially grateful to Caroline Constant and Lydia Soo, who read the introduction, the first, second and fifth chapters and offered valuable suggestions and criticism. I am also thankful to Ruth Wilkie for casting a critical eye over the text of the first chapter. For advice and illustrations I would like to thank Simon Unwin from the School of Architecture, University of Dundee who kindly gave me his photographs, which I used in the first chapter. Special thanks go also to the students I worked with, especially Anna Radcliffe, Helen Carey, Sam Austin, Chris Richardson, Hattie Stroud, Melissa Beams, Andrew McGee, Ziad Aazad, Nick Senske, Ying Xu, and particularly those who helped me with the illustrations in the book, Hattie Stroud, Danielle Peto, Mathew Soisson and Kush Patel from the Taubman College.

I am grateful to Caroline Mallinder, Alex Hollingsworth, Fran Ford, Georgina Johnson and their team from Routledge, who have provided constant support while completing this book. I wish also to thank the editors of the *Journal of Architecture*, Routledge and Spon, the original publishers of the papers 'The Parthenon and the Erechtheion: the Architectural Formation of Place, Politics and Myth' and "'The Book and the Labyrinth Were One and the Same" – Narrative and Architecture in Borges fictions' which I have incorporated into Chapters 1 and 3. The sixth and seventh chapters expanded the work published in S. McLeod (2005) *Reshaping Museum Space, Architecture, Design, Exhibitions*, London: Routledge. This work was part of a research and consultancy programme developed in conjunction with my late colleague Dr Tadeusz Grajewski and in collaboration with the Art Gallery and Museum Kelvingrove, Glasgow, the Museum of Scotland, Edinburgh, the Natural History Museum, London and the Burrell Collection, Glasgow. Finally, the eighth chapter on the Museum of Modern Art, New York (MoMA) is an expansion of my collaboration with Jean Wineman, Ipek Kaynar and Ying Xu, which started two years ago.

I would like to give special thanks to my colleague and close friend Sylvia Harris and the staff in the library of the Welsh School of Architecture, Cardiff University, to Rebecca Price and her colleagues in the Arts, Architecture and Engineering Library of the University of Michigan and to Susan Palmer and the library staff in the Sir John Soane's Museum. I thank Sandy Patton and Carole Kent from the Taubman College for their tremendous support in obtaining copyrights for the illustrations in this book and applying for funding. I am also thankful to the Taubman College and the Rackham School of Graduate Studies in the University of Michigan for funding the study on the Museum of Modern Art, New York (MoMA).

I wish to thank Glasgow Museums, the Museums of Scotland, the Natural History Museum, London and the Museum of Modern Art, New York for their interest in our work and their support in undertaking these projects. I am especially grateful to Mark O'Neil from Glasgow Museums with whom Tad Grajewski and I worked closely on the Art Gallery and Museum, Kelvingrove, Glasgow and the Burrell Collection, Glasgow, and to Sarah Ganz from the Museum of Modern Art, New York (MoMA) for her helpful comments on the eighth chapter.

The following individuals and institutions have graciously agreed for photographic material and images to be included in this publication: the American School of Classical Studies, Athens, Arts Resource, New York, Artists Rights Society, New York, The Bibliothèque National de France, Deutsches Archäologisches Institut – Athen, The M. C. Escher Company – Holland, The National Gallery, London, The Natural History Museum, London, The MIT Press, Soizick Meister, Museo del Prado – Madrid, Tate, London, and the Trustees of Sir John Soane’s Museum, London.

I have reserved a special mention for the late Tad Grajewski with whom I shared four years of friendship and intensive work in the area of museums and galleries. Without his energy and continuous support a great deal of this work would not have been accomplished. Tad had the skill to make things happen effortlessly and the capacity to share the enthusiasms of his colleagues and turn them to his own. He left a gap no one can replace, refusing to distinguish the value of work from the value of friendship and collaboration.

Between originating the idea for a book and delivering the final manuscript there are momentary periods of elation, endless periods of frustration, sleepless nights and monastic detachment. Throughout all of this I have had the constant support of Tony Mulhall whose reassuring normality kept me anchored. Together with his steadfastness he has provided me with the encouragement to take risks, when it might be easier not to. I would also like to pay tribute to Rhea Psarra, who translates my writings in Greek and gives them new meaning. And to Athena, who is now starting her classical education. I hope one day she finds this work rewarding.

This book is dedicated to Eleni Psarra, who in telling the story of Oedipus to me ignited at an early stage a passion for dreaming and inquiring; and to Panayotis Psarras who brought home his cartographic instruments, ink pens, setsquares, compasses and theodolites, and first explained the role of geometry in mapping space and thinking. *Architecture and Narrative* is permeated by their impalpable gifts: language and drawing.

Introduction

We must then, in my judgment, first make this distinction: what is that which is always real and has no becoming, and what is that which is always becoming and is never real? That which is apprehensible by thought with a rational account is the thing that is always unchangeably real; whereas that which is the object of belief together with unreasoning sensation is the thing that becomes and passes away, but never has real being.

– Plato: *The Timaeus* of Plato, trans. F. M. Cornford, London: (1937), *Plato's Cosmology* Routledge & Kegan Paul.

Labyrinth

There'll never be a door. You're 'inside'
and the keep encompasses the world
and has neither obverse nor reverse
nor circling wall nor secret centre.
Hope not that the straightness of your path
that stubbornly branches off in two,
and stubbornly branches off in two,
will have an end. Your fate is ironbound,
as is your judge. Forget the onslaught
of the bull that is a man and whose
strange and plural form haunts the tangle
of unending interwoven stone.
He does not exist. In the black dust
hope not even for the savage beast.

– Borges, J. L. (1968), *Nueva Antología Personal*,
Buenos Aires: Emecé Editores.

Formulating the question

Put plainly, this book is about architecture, spatial cognition and meaning. It looks at how spatial and cultural meanings are constructed in buildings and how they are communicated to their viewers. The choice of *Architecture and Narrative* for the title is meant to convey exactly this. Architecture carries content through the arrangement of spaces, materials, social relationships and the cultural purposes with

which it is invested. It is underpinned by agencies and the systems of thought that are involved in its production. But since narrative is often considered as something quite different – a story, a sequence of successive actions and events – it is important to begin by explaining this focus on architecture and narrative, and clarify the way in which the notion of narrative is used in this work.

Narrative is often seen as a form of representation bound with sequence, space and time (Cobley 2001: 3). But it is also regarded 'as structure, a particular way of combining parts to make a whole' or as narration, as the process or 'the activity of selecting, arranging and rendering story material in order to achieve specific time-bound effects on a perceiver' (Bordwell 1985: xi). A narrative requires a narrator and a reader in the same way in which architecture requires an architect and a viewer. A narrative, therefore, is not only the content of the story that is narrated, or the way in which it is interpreted by readers, but also the way in which it is structured and presented to an audience by an authorial entity, a writer, a film-maker, an architect or the curator of an exhibition. The relationship between narrative structure, perceptual experience and representation is the aspect of narrative that is most relevant to architecture and the subject of this book.

Narrative enters architecture in many ways, from the conceptual 'messages' it is made to stand for to the illustration of a design through models, drawings and other representational forms.¹ This aspect of architectural expression, what the design *speaks of*, is relevant to narrative as representation. It concerns the semantic meanings of buildings and places, and the contribution of architecture to the expression of social and cultural messages. But architecture does not only express meaning. It also participates in the construction of meaning through the ordering of spaces and social relationships. Architects respond to this ordering by orchestrating relations independently of a viewer's perception, and visualizing space as a perceptual condition, from the hypothetical viewpoint of a spatially situated observer. Relating visualizations of three-dimensional spaces and abstract frameworks of rules, architects arrange conceptual and perceptual layers of order.

Two main questions are raised in this work: first, how can we explore the relationship between conceptual structure and perceptual experience, the field of abstract relations and that of bodies experiencing space? And, second, how do these fields contribute to the formation of cultural content? The relationship between the conceptual and the perceptual was discussed in the second half of the twentieth century as part of two powerful and interrelated oppositions: form and function, form and meaning. These binarisms arose as a reaction to the utopian visions of Modernism and its underlying assumption that by manipulating building forms we can affect the ways in which we live in spaces, shifting the emphasis away from social performance to social meanings. Symptomatic of this response was the reaction to any notion of order and formal description. The implication is that morphological relations do not bear on what architecture can possibly mean, since meaning is indeterminate and socially produced, subject to contextual histories, nostalgic symbolisms, multiple identities and freedoms. In recent years order is rarely discussed, laden as it is with failed utopian dreams of social order no longer

considered relevant. It is charged with de-contextualizing places and disguising through the transparency myth dominant modes of production.

But if morphological order does not matter, then we could do away with architecture as a social and aesthetic practice or let it happen by chance. Conversely, if architecture has any social significance at all, we cannot afford its isolation from society through arguments that split it into empty forms and social meanings. This book does not adopt the view that architects are the only agents responsible for social content. Underlying all of these chapters is the assertion that there are multiple factors contributing to its formation, social, economic and political, including those external to the agencies directly involved in the design and production of buildings. The relationship of form to meaning should not be reduced to a simplistic binary opposition, but broadened to a more complex theoretical and analytical description. In addition, it should expand to include space as we confront it in daily life in buildings. This book investigates how architecture is *conceived* in the abstract realm of formal and spatial relations, how it is *perceived* in the physical and social space of embodied experience, and how the conceptual and perceptual affect cultural content. It addresses this subject within the cultural context in which buildings are situated, looking also at how architectural theory and practice affect its construction. *The interest is less in identifying the narrative dimension of buildings or their intended signification than in describing the formal, spatial and cultural mechanisms that give different shape and form to meaning in different buildings. More importantly, the concern is in exploring the potential of architecture to overcome conventional cultural norms, generating instead a rich potential for meaning.* This discussion leads naturally to a question addressed in the final chapter: how is it possible to approach the study of architecture in terms of its potential for innovation?

Running throughout the discussions in the book are two fundamental propositions: first, meaning is not exclusively in the morphological properties of space themselves, nor in the cultural processes of its formation and interpretation, but in the dynamic network of spatial, social, intellectual and professional practices that embody and produce different kinds of social knowledge. Second, architecture cannot be reduced to the duality of the conceptual realm and the reality of bodies in physical space. This duality appears as a long-standing division between mind and body endorsed by architectural and philosophical theories. In architectural practice it is often manifested as a poetic *illusion* of a dichotomy, advancing either the humanist view of a universe ordered by abstract relations or the romantic view of individual sensibility and freedom. It is argued that architecture orders experience through *space-time relationships* that interface the realm of the conceptual and the world of the senses, away from the traditional binary model of abstract and physical.

Conceptual, perceptual and narrative

The first architect to recognize that the conceptual and the perceptual aspects of space are expressed in the recent history of architecture through a dominant opposition was Bernard Tschumi. 'On the one hand, architecture as a thing of the mind, a dematerialized or conceptual discipline with its typological and morphological varia-

tions, and on the other, architecture as an empirical event that concentrates on the senses, on the experience of space' (1999: 83). Tschumi argues that the conceptual aspects (or 'Pyramid of concepts') and the perceptual characteristics of architecture ('the Labyrinth of experience') are interdependent and mutually exclusive. This is because one can never go outside of the Labyrinth and see the whole. 'Architecture constitutes the reality of experience while this reality gets in the way of the overall vision' (49). The relationship between the conceptual and the perceptual characteristics of space, between patterns we can hold in our mind at once and those we grasp gradually through movement, is one of the main concerns of this book. It does not consider the two kinds of relations as mutually exclusive, as Tschumi suggests, but as different and interacting systems of ordering experience. It explores how relationships are formed and experienced through these layers of ordering and how they communicate cultural meanings. The conceptual-perceptual question is also a matter of knowledge and cognition. It refers to how buildings are grasped as manipulations of space and form, implying a cognitive link between architecture, the designer and the viewer.

In Tschumi's view the perceptual aspects of architecture are sequences of spaces and events, 'configurations-en-suite, enfilades, spaces aligned by a common axis' (155), implying the movement of an observer. Events are about 'social and symbolic connotations' or 'programmatic sequences' (154). As he explains, an implied narrative exists, combining 'the presentation of an event (or chain of events) with its progressive spatial interpretation (which of course alters it)' (163).² Architecture is not a story or a sequence of events, but this book sees the conceptual properties, perceptual experience and the organization of the cultural message as its potential instruments for narration.

The encounter of architecture and narrative is studied here in museums, galleries and cultural buildings, examining how the arrangement of space relates to the arrangement of objects and the design of exhibitions. Exhibition narratives are different from other narratives in that they are constructed by the interpretation of a collection of artefacts. This means that objects are classified and arranged in space according to some aesthetic principle or some conceptual underlying framework that orders knowledge in a particular field. While narratives in other media are based on representations of time and space, museum narratives are organized *in space* depending on the ways in which the artefacts are positioned in a layout. Objects can be viewed for their own importance, but the design of the exhibition has the potential to construct additional meanings for each piece based on the spatial and visual interrelationships with others. Given these characteristics, museum narratives can illuminate the ways in which the conceptual and perceptual characteristics relate to the conceptual mechanisms governing the display. Additionally, the analysis of museums can explain how the organizing principles of space and the collection relate to the exploration patterns of visitors and, therefore, how these buildings become sites for different types of narration.

For the analytical discussions this work studies nine buildings that are widely known for their architectural quality and their pervasive influence on the discipline of architecture. Some of these buildings are examined in pairs, using

comparison as a strategy to clarify similarities and differences and sharpen their description. Others are discussed individually, developing the intellectual threads that permeate the book. In addition, there are two chapters whose starting point is literature instead of architecture. These chapters examine four metaphysical stories in *Ficciones* by Jorge Luis Borges. The reason for analyzing works of literature is because, similar to the sequential motion of perception through language, buildings are experienced gradually through movement. Borges used architectural models as symbols of knowledge and of the mind, expressing his ideas of the world as a 'garden of forking paths' and as an infinite library composed of hexagonal galleries. But he also employed conceptual strategies, such as fictions contained within fictions, reflections, symmetries, doublings and bifurcations in space and time. These strategies resemble the conceptual mechanisms used to organize spatial relations in architecture. Together with the sequential unfolding of his text, they serve as a basis for exploring whether the architectural construction of experience can be informed by the construction of experience in a literary work. This I propose is possible through the notion of *structure* and *sequence* in a text, and the notions of conceptual and perceptual in architecture.

Theoretical premise

Before presenting the individual chapters, the theoretical considerations underlying the analysis will be introduced. The discussion of meaning is approached, first, by looking at the intrinsic characteristics of buildings and, second, by examining them in relation to areas of knowledge extrinsic to the morphological system. Such areas include the conceptual structures used by curators to organize the exhibitions as educational, institutional, political, religious or mythical messages, and the theoretical concepts used by architects to justify their design decisions. This is to allow an analysis of building morphology, as well as of the way in which buildings embody or destabilize extra-spatial systems of abstractions and semantic relations.

The morphological study is based on the notion of interrelatedness of parts or the structural relationship of parts to other parts and to a whole. This idea can be best captured by Bill Hillier's notion of 'configuration'. An intuitive definition of configuration is as 'a set of relationships among things all of which inter-depend in an overall structure of some kind' (1996: 33). A formal expression of this idea is provided by the relationship between two spaces and the ways in which this changes when we connect one or both with a third space. Configuration then is founded on interconnectedness, where each relation is defined in association to all others (35). Hillier explains that spatial configurations are 'non-discursive'. We understand them intuitively, but have no words by which we can discuss them analytically. This problem is characteristic not only of architecture but also of other forms of cultural expression. In language, for example, we may believe that in constructing sentences we handle words. However, it is the configurational syntactic and semantic rules that enable us to understand how words are assembled into meaningful arrangements rather than the individual word units. These rules operate as hidden structures we 'think with' that 'tell us how things are to be assembled, and work below the level of consciousness' (40).

These ideas underpin the framework within which buildings are discussed in the book as spatial arrangements. But it is important to explain that the notion of configuration is not simply about abstract rules. Firstly, it is relevant to the spatial and formal properties we experience through everyday use and our embodied presence in buildings. It concerns characteristics we observe as we move and change spatial positions. Secondly, it is associated with social relations in the sense that it spatializes in a variety of ways functional differences in buildings and the relations among the social groups that inhabit them (36). Through their configurational rules some buildings embody and reproduce social knowledge reflecting how things happen and where. However, configuration is also the means by which buildings can overlay a field of possibility on social knowledge, generating social co-presence and movement. It can shape the spatial conditions for social interaction to take place as a realization of a potential rather than as determinant.

Together with describing morphological properties the book engages the varied ways in which such properties express semantic content. This requires a clarification of the distinction between two types of meaning: one based on configuration and the other on signification. As explained, the former refers to the notion of interdependence of elements that are intrinsic to architecture seen as a system of spatially situated practices and embodied experience. The latter concerns what architecture refers to beyond its own pattern of space, like power, religious structures, and social or political ideology. Discussing how buildings become intelligible Hillier suggests that a theory of signification must be based first on a theory of significance, 'as an instance of the ordering possibilities we call architecture' (1985: 67). 'We must, if you like, have a theory of how architecture can mean anything at all, before we have a theory of what architecture might actually mean.' The description of buildings in the book moves in this direction: from social meaning achieved through the ordering mechanisms of space to meaning constructed through cultural association. The reason is that attributing semantic content to architecture prior to examining content deriving from its own properties confuses the properties themselves for the meanings that are represented.

This observation brings us back to the role of language in analyzing space. It is sometimes believed that a linguistic or etymological study can illuminate the ideas found in texts or buildings as in Indra McEwen's analysis of concepts in archaic and classical Greece (1993). It is important to know the history of words and what they meant in the context in which a building was produced. However, such history refers to what a concept means collectively for the society that uses it, rather than explaining the complex spatial characteristics embodied in buildings. The need for a morphological study is based on the insufficiency of language in describing spatial arrangements. We must provide an account for morphological characteristics since words signify concepts rather than describe morphological properties. Only then must we turn to consider what the words contemporaneously used to express these concepts might have meant at that time.

And, yet, when it comes to language what matters most is not the words themselves but how architecture is discussed in different social realities and contexts. This allows the introduction of the second theoretical consideration that

is drawn on in the book. While it is essential to establish a theoretical and analytical difference between social knowledge based on spatial laws and knowledge external to the morphological system, it is also crucial to recognize that these types of knowledge are neither static nor self-contained. Instead, they overlap and change over time. Buildings are examined within their historical context to see how certain historical realities, values or social processes implicated in their production can enrich meaning (Marcus and Cameron 2002: 10). In addition to this, the work is interested in how spatial and social practices are related to the ways in which buildings are described through theoretical models and interpretations. Architecture is not equivalent to words or to the various theories used to describe it. As Henri Lefebvre observes, a spatial code 'is not simply a means of reading or interpreting space: rather it is a means of living in that space' (1991: 47). But, the kinds of knowledge used by architects or other specialists also constitute the way in which space is lived, produced and conceptualized (41). So, the codes describing how space works in daily life overlap with space as discourse and theoretical knowledge. These suggestions are explored in the concluding chapter of the book, suggesting that morphological analysis should be placed within the study of models of thought that have underpinned architecture and their historical evolution.

Analytical framework

Coming to the analytical framework for studying how designs interface the conceptual with the perceptual order, the book focuses, first, on geometric properties independently of a situated observer, such as symmetry, rhythm, alignment, congruence, or repetition. Second, it examines buildings as perceptual fields and explores those parameters that are observable by a viewer located within space, and those configurational properties that can be discovered by real time experience. These characteristics are described using simple analytical tools from 'space syntax' – a theory and method founded by Hillier and Hanson that describes space and relates it to social meaning. These methods are rooted in embodied experience. Visual axes, visibility fields, sequences of visual information and diagrams of spatial connections are examples of these tools. They encapsulate how spaces are visually linked in sequence, how they are interrelated or how simple or complex it is to approach other spaces starting from a particular place in a building.

In the cases of the Barcelona Pavilion and the Soane's Museum discussed in the second and fifth chapters the investigation is extended to include the visual fields constructed through reflective materials. Except for these cases the book does not account for the wide range of perceptual factors such as light, sound, texture and temperature or how construction methods and materials impact on perception. It is important to explain that the main intention is not to promote an ocular-centric view of architecture, but to isolate one among the multiple factors affecting experience, and provide a focused study of the conceptual and perceptual founded on visibility.

Structure, content and argument

The book is structured so as to explore the relationship between architecture and narrative in three ways: first, by focusing on buildings of an iconic architectural status

that are freed from social programme (Chapters 1 and 2); second, by analyzing works where the medium is language unfolding in a linear sequence, as in the case of literature (Chapters 3 and 4); and, third, by examining buildings whose social purpose has a strong narrative dimension (Chapters 5 to 8). So, the discussion moves from buildings where space and form take predominance over the semantic content of function (first part of the book), to literary narratives where the representational content is foregrounded over formal codes (second part), and, finally, to examples like museums and galleries that balance codes of space and form with those of representational narrative content (third part).

The first part discusses three buildings whose aesthetic value has turned them into idealized abstractions of permanent significance: the Parthenon, the Erechtheion and the Barcelona Pavilion. The Parthenon and the Erechtheion projected the political and religious image of fifth-century BC Athens. The Barcelona Pavilion has been often considered as a representation of the Weimar Republic in the 1929 International Exposition (Bonta 1979: 131–224). However, in spite of their cultural content the three buildings did not order a set of social relations through their interior spaces. The aesthetic value of these works and the absence of programme enable a study of the spatial construction of meaning separately from those meanings associated with social functions.

The second part examines Borges' fictions where language and representations of space intersect so that it is often impossible to consider them separately. The progression from the first to the second part of the book facilitates a discussion of how architecture and literature order experience. The former organizes a set of abstract relations and visual fields that we explore through movement. In the latter space is represented rather than being physical. However, similar to architecture where conceptual codes articulate spatial relations, conceptual relations in the text give the discourse an abstract spatial dimension. In addition, similar to physical space perceived in linear progression, the literature text creates a set of relations among narrative elements that are perceived in sequence.

The third part explores the encounter between the spatial formation of meaning and the conceptual organization of meaning, through the arrangement of the collection in museums and galleries. Exhibition narratives are different from literary narratives in that they arrange objects in physical space. The spatial interrelations of objects enable a focused study on how space and the content of the exhibition interact. This examination looks at how spatial and cultural narratives are brought together through physical relations of building elements, and physical and conceptual relations among artefacts.

Coming to the discussion of the individual buildings, the opening chapter studies the Acropolis in Athens and its important structures, the Erechtheion and the Parthenon, emblems of the city 'where sculpture and architecture converge and to distinguish them becomes not only impossible but irrelevant' (McEwen 1993: 2). The Parthenon integrated the sculptural narrative with a regular and formal physical fabric. In contrast, the Erechtheion accommodated a series of emblems associated with the mythical origin of the city in a building that is irregular and idiosyncratic. Between the poles of the two temples lies a dialogue between properties that are

conceptually accessible in 'fixity' or in an instant and those that can be grasped experientially through movement. This dialogue sets in motion the dialectic between the religious and sculptural content of the two temples expressing the fifth-century perception of the *polis* on one hand, and archaic perceptions of Athens through local myths and religious practices on the other. The first chapter constructs the intellectual framework for the rest of the book. But it also initiates a larger dialogue about notions of the mind and the body, intellectual and sensual, regular and irregular, formal and informal, knowledge and imagination, nature and artifice. Gelernter observes that the opposition between abstract ideas we grasp with our mind and the characteristics we observe through our senses is built into Western design theory from an early stage as a subject-object problem (1995: 27). It is beyond the context of the present work to resolve the philosophical dilemmas involved in these dichotomies either through the discussion of the Parthenon and the Erechtheion or the subsequent chapters. However, in its sampling of buildings, literary texts and works of art, the book discusses ideas that make their appearance as contrasts either implicitly in certain examples of Western architecture, or explicitly through philosophical and cultural demarcations, such as Rationalism and Empiricism, Classical and Romantic.

While the Parthenon and the Erechtheion are examples of pre-modern space, the other buildings discussed in the book date from the nineteenth and twentieth centuries. The intention is not to remove the two temples from their historical context and identify similarities or differences between ancient and contemporary structures. The purpose is rather to introduce the notions of the conceptual, perceptual and cultural meaning through two examples that in spite of their immense influence have been mainly approached from the point of view of harmonious systems and numbers. It is also to address these notions through two buildings that were contemporary to philosophical developments that generated a split between the intellectual world of abstract concepts and the natural world of sensual appearances. So, the analysis of the two temples aims, first, to explore a set of ideas that have their roots in Classicism by focusing on formal and spatial characteristics rather than mathematical patterns; second, to explore the relation of these characteristics to the cultural and political content of the two buildings through their respective mythical narratives; and, finally, to draw attention to the ways in which architectural discourse has been affected by a contrast between mental and physical. The underlying proposition is that the relationship between the two realms can be addressed only through a joint analysis of the conceptual properties of space and those properties we observe through spatial experience.

No other building encompasses such contrasts or more strikingly demonstrates their tensions more successfully than Mies van der Rohe's German Pavilion in Barcelona. Together with the short life of the pavilion and its legacy in defying meaning, these oppositions have attracted diverse interpretations, ranging from a classical temple (Padovan 2002: 110) to a small landscape (Constant 1990), and from a symbolic house (Padovan 2002: 110) to a 'palace of reflections' (Quetglas 2001: 136). Recent literature on Mies showed a shift from the 'realm of the autonomous form' to the real world of experienced time (Krauss 1994: 134). This change of

interest from the formal to the experiential is symptomatic of a perceived dichotomy between abstract order and observable patterns discussed earlier. The second chapter of the book attempts to explore this dichotomy, looking at the Pavilion in terms of geometrical symmetry and visual symmetry constructed out of reflective materials (Evans 1997: 233–72). Rethinking the building in these terms shows that Mies used partial geometrical symmetries, which are not evident in the surface appearance of the building. He also employed geometrical alignments to control the position of surfaces in relation to issues of optical experience. Finally, he used reflections not only to create multiple symmetries but also to construct the perception of a unified enclosure. Mies, it is suggested, did not oppose the power of geometry to regulate, but resisted the dominant role of geometry to guide our understanding prior to the real unfolding of the world in front of our eyes through embodied experience.

Symmetry and reflections in decomposing and restoring coherence are used extensively in Borges' fictions. Not only are mirrors and symmetrical structures incorporated in his work, but also conceptual symmetries link happenings outside the sequential unfolding of the narrative as a causal chain. The third chapter examines three of Borges' detective stories in terms of narrative structure and the linear progression of the text. It also focuses on the architectural models that appear in his stories, expressing systems of thought associated with classical architecture and the Romantic landscape movement. Architecture and literature for Borges coalesce in the interaction between relations grasped synchronically and those we perceive sequentially. This is expressed through the notion of the 'labyrinth' – a building or a text – that can be conceived by its 'architect' all at once from outside its space, and by its 'explorer' who experiences it sequentially through time (Faris 1988: 4). Borges' use of symmetries, mirrors and labyrinths remind us of Tschumi's notions of the 'pyramid of concepts' and 'labyrinth of experience'. But while Tschumi sees a division between these concepts in recent architectural theories, Borges uses them to create aesthetic juxtapositions. His purpose is to express that the conceptual structures architects, theorists and scientists use to represent the world and the real world do not necessarily coincide.

In the *Library of Babel* Borges' narrator is an archivist who searches for modes of order in a chaotic space that merges with language through meaningless books and infinitely expanding hexagonal galleries – 'a storehouse of the culture of several millennia' (Eco 2006: 115). The fourth chapter attempts to construct a model path inside Borges' Library as a mechanism for navigating through the philosophical ideas of the fiction. It proposes that Borges *speaks of* units of language and architecture that rotate and recombine *ad infinitum*, but it is primarily the tools he *speaks with* that construct the idea of infinite combinations. Symmetrical relations in the paragraph content create associations among ideas so that they eventually merge into infinite combinations. These ideas express philosophical dilemmas between real and ideal, finite and infinite, absolute and relative. In this fiction Borges articulates his view of the labyrinth as the domain of culture, or as the space of Western knowledge where the creator/designer and the explorer/wanderer are mirror reflections of each other. Meaning derives not from the antagonistic relationship between these two

notions, but from the ways in which a work articulates their creative tensions, fusions and juxtapositions.

The role of reflections in Sir John Soane's house-museum is the subject of the fifth chapter. Situated between Enlightenment thought and the Romantic tradition, the house is the epitome of the influence of Classicism and Le Camus de Mézières' theory of sensation on Soane (Watkin 2000: 20, Pelletier 2006: 6). Le Camus considered architecture as an expressive language conveying specific emotions through light, shade and theatrical effects. In ordering the house and its contents Soane constructed a rich field of visual interconnections incorporating these effects and reflective surfaces that suggest the idea of boundless space. These strategies and Soane's informal arrangements of ruins, mirrors and narrative curios turn the house into a combinatorial exercise of spatial and semantic relations relevant to Soane's interest in the union between poetry and architecture. They open it to a larger universe of history, but also fold it back onto itself, in multiple ways, to express the personal narrative of its owner and his mind.

The Soane's Museum works as a bridge between the study of meaning in architecture and literature in the first two parts of the book, to a more concentrated study of the relationship between space and narrative in museums, whose programme specifically engages the production and transmission of knowledge and cultural content. The sixth chapter concerns the Victorian stage of museum development based on the nineteenth-century view of museums as 'texts' using classification practices to map knowledge seen as objective and universal. It compares the Natural History Museum in London with the Kelvingrove Art Gallery and Museum, Glasgow, which reflect two antithetical attitudes to the study of nature in Victorian Britain. The axial symmetry and the visual separation among spaces in the former express a hierarchical structure analogous to the classificatory strategies employed in the study of nature, which broke up specimens by hierarchical principles of similarity and difference according to the visible patterning of their form. The visual integration in the Kelvingrove museum, on the other hand, enables an interaction of the study of the natural world with other areas of knowledge. The essence of the former is in naming things and ordering them through a relationship between language and taxonomy (Foucault 2002: 226). In the Kelvingrove the spatial interconnection of natural history, industry and trade introduce a fluid relationship between the order of nature, the order of making things, and the order of exchange. Objects are no longer fixed through language in their unchanging positions, but enter relations over and above their spatial location in gallery rooms by virtue of being spatially inter-visible.

Visions of nature in the two buildings are interwoven with perceptions of identity as the Natural History Museum celebrates knowledge on the divine project of nature mediated by the imperial collection, while the Kelvingrove grounds secular knowledge of nature on the Scottish national industrial project. The next chapter addresses the relationship between the spatial characteristics, the approach to nature, display and identity through two contemporary buildings: the Museum of Scotland by Benson and Forsyth in Edinburgh, and the Burrell Collection by Gasson, Meunier and Anderson in Glasgow. Between the two Victorian and contemporary museums there is a century of significant changes, the most important of which

is the replacement of knowledge as 'objective' and scientific by the notion of interpretation. Museum architecture follows these changes, shifting from shaping and displaying knowledge to expressing the curatorial message, and from a public monument to an educational and leisure destination.

The two museums respond to a particular vision of identity, the national identity of Scotland on one hand and the personal identity of William Burrell, the donor of the Burrell collection, on the other. Both show an influence from John Soane, one through the treatment of space, light and the integration of the displays with the design, and the other by building a portrait of Burrell and incorporating fragments and ruins into the building. But in spite of similar influences they demonstrate striking contrasts. The Museum of Scotland is situated in the historical centre of Edinburgh, making history the subject of the display, while the Burrell is built in a park, turning the woodland to a central theme of the installation. The former has a conceptual and experiential centrality, and an exhibition arrangement that advances in historical sequence from the basement to the roof terrace. The Burrell lacks both the 'coherence' of a centre and thematic coherence in the collection. It is arranged as a 'walk in the woods' that integrates the building against the backdrop of nature. The two buildings and their narrative organization advance contrasting conceptual strategies: history as progress based on rectilinear development, and its reverse metaphor, history as an idealized form of nature or as Arcadian model. But, more importantly, the two buildings provide two different models of arranging space and arranging exhibitions. The first one subjects the structure of space to the overpowering message of the collection. The second one contrasts the semantic orientation of narrative in the areas devoted to Burrell with the generative power of space to create aesthetic juxtapositions in the rest of the gallery spaces.

The museum most characterized by a 'progressive' identity is the Museum of Modern Art in New York, containing one of the world's most comprehensive collections of twentieth century art. Its organization was based on a historical precedent of a comprehensive narrative proposed by Alfred Barr's classification of early twentieth-century art into a 'rational' and an 'intuitive' current (1936: 19). But in its latest expansion the museum contrasts the notion of a synoptic view of history with alternative narrative strategies. The eighth chapter investigates the relationship between architecture and narrative in the new building and the ways in which it can be understood through the ordering of space and the movement patterns of visitors. It argues that the new installation changes the earlier display concept, encouraging interrelations among works, styles and historical movements. But at the same time it adheres to Barr's historic interpretation, demonstrating an ambiguity regarding its commitment to history and to innovation.

The ninth chapter offers, first, an investigation of the conceptual and perceptual through a brief review of discourse, attempting to place the questions raised in this book in a wider context. Second, it provides a theoretical synthesis of the individual chapters. The theoretical review discusses the roots of the conceptual-perceptual relationship in a philosophical dilemma of subject and object, the mind and the world, originating in the pre-Socratic philosophers and Plato. This dilemma influenced architectural theory as a question of the relationship among mathematical

proportions, geometrical forms and the ways in which they register in perception. With the rise of the importance of space in architectural inquiry in the eighteenth and nineteenth centuries and later with Modernism, the theoretical basis of the conceptual and the perceptual shifted from form and its visual perception to space and embodied experience. The work of Tschumi, Lefebvre and Hillier and Hanson is discussed next, providing a theoretical and analytical framework to describe spatial relations.

In the comparative review of buildings I show that the interaction between the conceptual and the perceptual is conditioned by different degrees of geometrical control imposed on visual fields experienced through movement. High degrees of geometrical co-ordination of visual information, as in a classical villa, result in low degrees of perceptual variation, channelling understanding towards a simple geometrical idea, which turns into a representational formal syntax. In contrast, a decrease in the levels of geometrical structuring of visual fields increases variation of perceptual information, releasing a variety of the ways in which buildings can be grasped as formal and spatial arrangements. The Barcelona Pavilion and the Soane's Museum fall into this last category, balancing the geometric co-ordination of parts with diverse and changing visual experiences.

Moving from the conceptual and perceptual to the cultural message, the comparative discussion reveals that the buildings discussed in the book divide into two broad categories: on the one hand are buildings that create a correspondence between the morphological orientation towards a simple geometrical concept and the conceptual orientation of the display or cultural programme towards one message. On the other hand are examples in which conceptual polyvalence goes hand in hand with the aesthetic and semantic polyvalence in the organization of the collection. The former operates according to a conventional or conservative mode that is concerned with signification in an explicit way, eliminating interpretive ambiguity by a definitive message. The latter functions as a system that is open to interpretive ambiguity. It is concerned with interpretation as process rather than message, stimulating spatial exploration and an engagement with its own mechanisms of construction.

The notions of a conventional and an unconventional mode are related to Umberto Eco's interpretation of art works as 'closed' or 'open', based on information theory (1989: 13). Closely related to this theory are the ideas of a *conservative* and a *generative* mode of space proposed by Hillier (2005: 98). The former describes cultural meaning embedded in space to reproduce a cultural pattern. The latter captures a rich potential of meaning generated by the spatial arrangement. Against the theoretical background of these propositions *Architecture and Narrative* shows that geometry, space and their interrelation order experience either through the reproduction of knowledge and conventional meanings, or through the generation of new knowledge of spatial and cultural relations.

These observations have the capacity to inform design theory, museum theory and the design practice of cultural buildings and exhibitions. A portion of this study confirmed these interpretations by looking at how visitors move in museums to explore the collections. In the context of this work it was shown that the *conservative* planning of space reduces the potential for spatial exploration by

channelling movement of viewers in a predetermined way. The *generative* mode encourages more variation in the exploration patterns of visitors, facilitating multiple and new ways of seeing the work while at the same time sustaining patterns of social co-presence. The exploration patterns of visitors have been addressed in other publications by this author, and in similar studies by other scholars.³ Although it is an important theme of this work, the priority is on studying the relationship of spatial morphology to the display and the models of thought that can illuminate these museums.

Returning to the conceptual and the perceptual, the ninth chapter argues that architecture is not an affair of the mind or of the senses; neither abstraction nor physical reality, but a dynamic relationship between abstract structures and those relationships that are discovered by moving in buildings. The ways in which the two interact might foreground one realm over the other, creating the *illusion* of a dichotomy, as in a classical building, where the unchanging views along an axial route highlight the abstract stable order at the expense of a varied visual experience, and in an eighteenth-century garden, where the impression is created of the absence of order. The dichotomy illusion presents an opportunity for some writers, architects or artists such as Borges, Mies and Soane to exploit the supposed gaps between the two aspects. The contrast between the mirror and the labyrinth in Borges' fictions is an expression of the tension between the conceptual symmetries found in the story and the understanding of the text as a linear progression. The Barcelona Pavilion and the Soane's Museum also use reflective surfaces and contrived spatial sequences, juxtaposing symmetry with a diversity of views discovered through movement. By employing multiple partial symmetries and long but distorted axes of sight they bring a level of conceptual understanding down into the experiential aspects of space. By creating a variety of perceptions, their architects resist the overall control of geometric and formal relations over perceptual experience. The creative tension of the two realms in the work of these architects unbalances the illusion of a binary opposition. It is the imaginative synthesis of the two models of spatial knowledge that can create a space where rational explication is measured against the enjoyment of spatial discovery, and where meaning is so fluid and rich that it can never be resolved in a single interpretation.

Architecture and Narrative raises the question of the relationship between how buildings are conceived as abstract patterns, how they are perceived as patterns grasped through sensual experience, and how these patterns relate to the structure of messages in cultural contexts. It does not undertake a comprehensive investigation of this subject. Rather through specific examples it demonstrates how the conceptual, the perceptual and narrative affect experience and meaning. These examples are not exhaustive but mainly suggestive, highlighting lines of development in what otherwise constitutes a varied picture.

The discussions of buildings and texts in the book contribute to the study of architecture through a set of theoretical propositions: *social meaning passes through the morphological properties of buildings themselves*. The distinction between form and meaning (Colquhoun 1985: 190), between form being

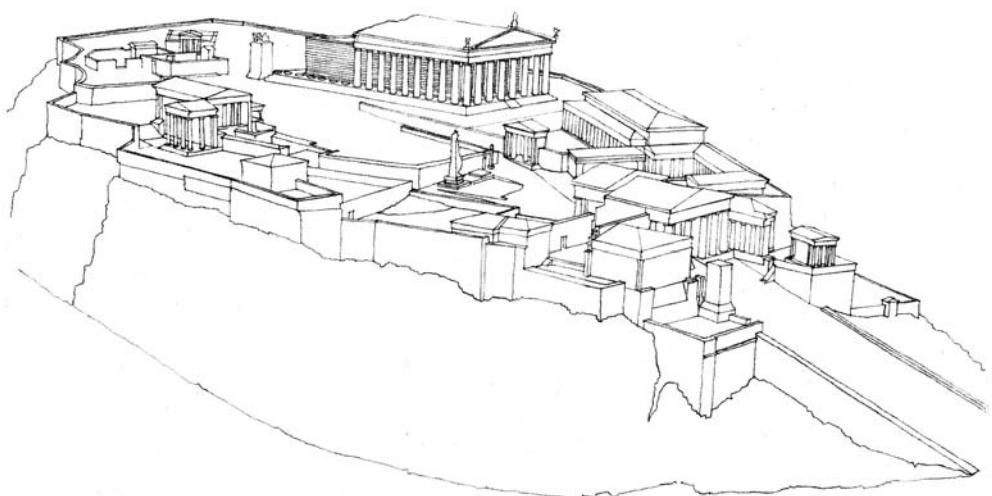
about abstraction (therefore meaningless) and meaning being about figuration (therefore meaningful), between Modernism and Postmodernism, Humanism and Post-Humanism, is useful only in understanding the assumptions and the theoretical propositions of architects from different periods and design traditions. It does not provide a valid theory for how buildings can be generally understood beyond the ideologies and opinions of their architects and their cultural influences. Spaces and forms cannot be interpreted either as meaningless assemblages or as isolated tokens of meaning, word-like elements carrying content by cultural association. On the contrary, they are situated within manifold frameworks of relations where every element is understood in its relationship to other elements, in a way that a change in these relations sets the system in motion towards a set of different meanings. *Social and cultural content is either embedded in the morphological system dictating its formation, or generated by the system itself as an emergent structure of possibilities.* The conservative and generative modes of buildings discussed earlier are examples of the two different ways in which buildings become meaningful, affecting the potential for originality of meaning.

There is a need to use a single theoretical framework for addressing architectural space that integrates the conceptual and the perceptual and clarifies their relationship. The theoretical and analytical explorations in the book argue for a study of architecture that moves away from fragmentary ideas about mental and physical to a more unified understanding of space. But at the same time the dichotomy illusion points to the fact that the way in which these notions are conceived by theorists, architects and those involved in the production of architecture is in itself a crucial parameter. A unified theoretical and analytical framework should extend to include the history and theory of the relationship between conceptual and perceptual notions of space. The social dimension of architecture is an essential factor in this framework and has been explored in this book through the study of spatial morphology and movement patterns in cultural buildings.

The final remark refers to the more general contribution of the book to architectural inquiry. This work argues for an analysis based on the synchronic selection of morphological sets to study their geometric, spatial and social logic, and an understanding of these sets diachronically through the evolution of buildings and thought systems. *What this book contributes to the morphological study of architecture, it is hoped, is the assertion of the need to locate the morphological analysis of buildings within the specificities of context and within historical and theoretical knowledge, in terms of conceptual, perceptual and social space. But while historical studies and theories can illuminate the ways in which architecture is conceived, they are not equivalent to the intrinsic properties of buildings themselves as spatial and social practices. The way in which the book can inform history and theory research is through the assertion of the necessity to analyze buildings through these three notions of space.* These undertakings underlie all of the investigations in the book and are necessary factors for any definition or study of architecture as a discipline.

Part One

Foundations



1.0
The Acropolis,
Athens.

Chapter 1

The Parthenon and the Erechtheion

The spatial formation of place, politics and myth

So grey-eyed Athena spoke and went away from him
across the barren and open water, left lovely Scheria
and came to Marathon and to Athens of the wide ways,
and entered the close-built house of Erechtheus.

– Homer (1965–67), *Odyssey*, trans R. Lattimore,
New York: Harper Perennial, vii, p. 81.

Introduction

This study of the Parthenon and the Erechtheion is motivated by the curious contrasts between the two buildings – contrasts that have been largely unexplained by architectural history. In spite of its innovations the Parthenon was part of an architectural tradition that developed over hundreds of years. It was formal and regular and integrated the physical fabric and the sculptural narrative into a single ensemble. The Erechtheion – its contemporary – on the other hand, was a break in this tradition, combining a variety of objects and points of religious significance with a striking irregular appearance. This chapter aims to explain the differences between the two temples in light of their religious and cultural content. It addresses this task from outside archaeology, art history and classics, but uses two main arguments from these disciplines to start the investigation: first, architecture and narrative in the Parthenon were so closely interrelated that it was impossible to distinguish the architecture from the sculptural representations placed on the building. Second, the two temples were intrinsically linked through an ancient ritual that was represented in the Parthenon frieze but terminated in the Erechtheion with the offering of the woven robe to Athena (Wycherley 1978: 114). It will be argued that the architecture of the two temples, their art, the cults they embodied and the entire scheme they were part of were all tightly interwoven and equally responsible for constructing their

cultural message. This message had two dimensions: a profane one referring to the contemporary identity of the city, and a sacred dimension concerning its ancient traditions. The Parthenon was intended to idealize democracy and the imperial power of Athens. In contrast, the Erechtheion was a demonstration of diverse cults founded on the archaic origins of the city.

Throughout the history of architectural thought, Greek temples either have the status of a remote but timeless past, subject to proportional and stylistic analysis, or the romantic status of antiquity and ruins. In what follows existing evidence is used not to reinforce these positions or to solve problems that archaeology and related disciplines address more successfully. Instead I will look at the two buildings through diverse fields of inquiry to locate them in a spatial, historical and ideological context. In this way, I hope to break their silence and reclaim them from the formalism of mathematical inspection, as well as from decay and solitude in the romantic imagination.

The building programme

Arriving at the Acropolis, today's visitors are initially struck by the Parthenon, or by the idea of staring at a monument that has had an enormous impact on Western culture (see Figure 1.1). But the impressions left by the building, its elegance, precise construction, simplicity and size, are reinforced by its contrast with the Erechtheion, a curiously complex and small structure built opposite, on the north side of the Acropolis (see Figure 1.2). There is no existing evidence to suggest that the Parthenon had a religious function. As Mary Beard observes, there were no priests or priestesses attached to it, 'no ancient religious festival or ritual is known to have taken place there, and it did not even have that most basic piece of Greek temple equipment: an altar directly outside its front entrance' (2002: 45). In contrast, the Erechtheion was associated with a number of religious activities referring to the mythical past of the city. It contained sacred sites, relics and an ancient statue of



1.1
The Parthenon,
Athens.

Athena to which a woven robe was dedicated as part of the ritualistic 'Panathenaic' procession.

The Parthenon's enigmatic silence grows larger in the presence of its neighbour. On the one side is a structure of enormous historical and aesthetic importance, the religious programme of which could be absent or remains largely unknown; and on the other side is a small and irregular shrine of strategic religious significance. What do these differences and contrasts mean? How did they relate to the social and cultural context at the time of their construction, or in later centuries, when the system that created them was marching to its final stages of forgetfulness and exhaustion?

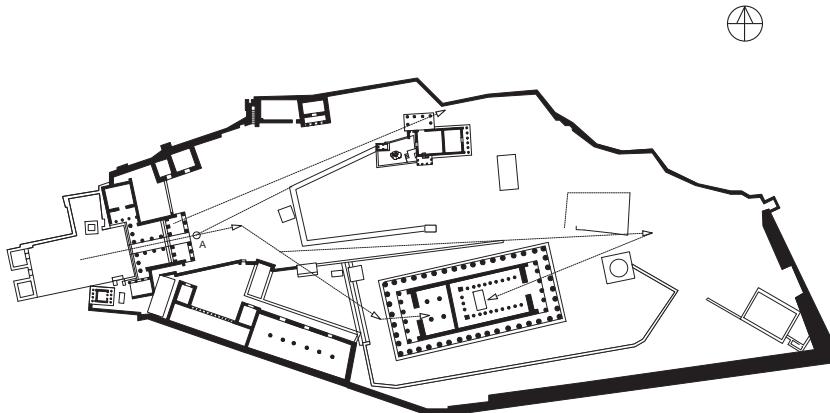
There are two main explanations for the Erechtheion and the unconventional complexities of its design. First, it results from the diverse sacred spots, rituals and traditions as well as from the topographical variety of its location. Second, its construction was interrupted by the Peloponnesian war that led Athens from a position of domination in the Delian league to decline and final humiliation (Wycherley 1978: 143). These arguments might explain causes, but they cannot account for how the incidental can be transfigured to achieve larger significance. The two buildings were products of an orchestrated attempt to manifest the victory of Athens in the Persian wars and its achievements in culture, politics and public life. But, more importantly, it will be argued, they were an attempt to 'rewrite' history through a synthesis of mythical apparatus and historical event.

The building programme started after the middle of the fifth century BC on the remains of previous archaic structures that were destroyed by the Persian war. The 'past had been wiped out' and much of what was sacred and old had vanished until, on the initiative of Pericles, the city was sufficiently confident to undertake the reconstruction (Bruno 1974: 62). There were three major structures erected on the Acropolis: the Parthenon built on the southern edge of the rock, the Erechtheion on the northern site, and the Propylaia, a monumental entrance building,

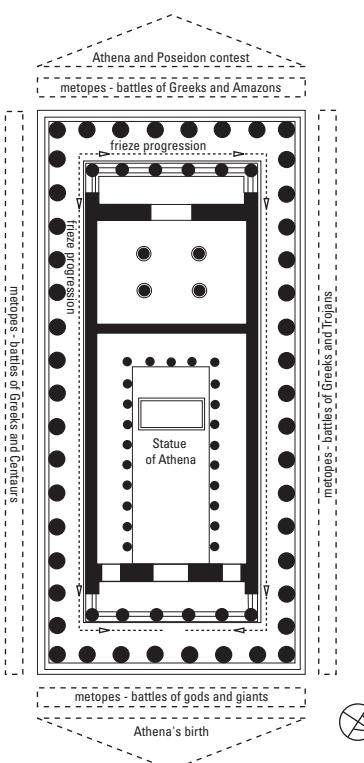


1.2
The Erechtheion,
Athens.

at the western side (see Figure 1.3). The Parthenon was dedicated to the goddess Athena. The west part of the Erechtheion was devoted to Athena *Polias* (patron deity of Athens), while the east part was dedicated to Poseidon-Erechtheus (Wycherley 1978: 150). So, the Parthenon was simple in physical form and in religious content, being dedicated to one goddess, while the Erechtheion housed more than one god and was physically and religiously complex.



1.3
Plan of the Acropolis, Athens. Point A is defined by the intersection of the central axis with the visual lines produced by the extension of the retaining wall and the edge of the Erechtheion sanctuary. Beyond this point the north portico of the Erechtheion would no longer be visible.



1.4
Plan of the Parthenon showing the progression of the procession on the frieze and the thematic content of the metopes and the pediments.

1.5

Propylaia, Athens.
(a) View from the approach route.



(b) Internal view.



The Parthenon was built on the foundations of an older temple of Athena as an entirely new Doric structure (in 447–435 BC). It differed in size and proportions from the previous temple and had many new features, the most important of which was the continuous frieze characteristic of the Ionic style along the inner side of its peristyle. The building was composed of two parts, each with a separate entrance: the cella (*naos*) housing Athena's gold and ivory statue, and a smaller room, the 'parthenon' (maidens' chamber), which gave to the entire structure its name. The

Propylaia was constructed next as a monumental gateway to the sanctuary (see Figure 1.5a, b).

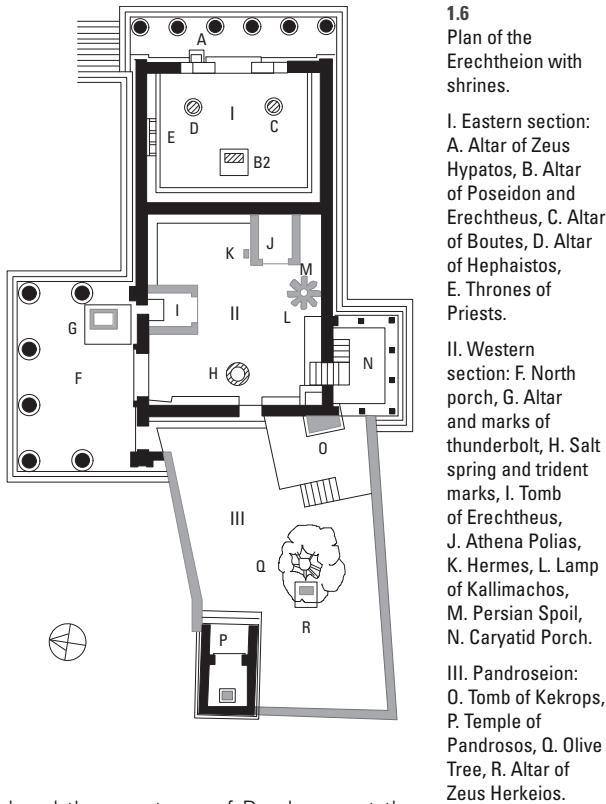
Work on the Erechtheion began in 421 BC and was complete in 405 BC. Similar to the Parthenon, it was built on the site of a previous structure, the Old Temple, and was used to house a sacred wooden statue of Athena.¹ The Erechtheion was built in the Ionic style and gathered several shrines and sites of religious importance in one structure (see Figure 1.6). Most of the design irregularities are found in the western area of the building: the northern portico extends outwards to give access to a courtyard containing Athena's olive tree and the sanctuary of Pandrosos; a small porch with female figures in place of columns is attached on the southern side. Finally, the western façade consists of a set of columns resting on a wall instead of the usual porch. This wall is perforated by a door connecting the interior with the courtyard and the sanctuary of Pandrosos at the lower level.

The morphological properties of the two buildings can be best understood in the wider context of Greek religious architecture. The following section examines the main types of Greek temples and their evolution from a single enclosure to a monumental structure with a peristyle (*pteron*), known as the peripteral temple (*naos peripteros*).

The evolution of Greek temples

The new architects of the Parthenon followed a design so different in character from the old that it became necessary to reposition every block of stone ... (Bruno 1974: 63).

The Parthenon was the first Doric monument to make use of an Ionic frieze and eight columns along its short side. In spite of these innovations, the design was a product of a tradition that extended from the Mycenaean '*megaron*', the basic prototype of temple design, to the peripteral building (see Figure 1.7a–g). As temples grew in size and complexity two main characteristics prevailed: an increase in the number of spatial layers such as porches and peristyles, and a formalization of relationships through bilateral symmetry and proportions. The properties that remained



1.6
Plan of the Erechtheion with shrines.

I. Eastern section:
A. Altar of Zeus Hypatios, B. Altar of Poseidon and Erechtheus, C. Altar of Boutes, D. Altar of Hephaistos, E. Thrones of Priests.

II. Western section:
F. North porch, G. Altar and marks of thunderbolt, H. Salt spring and trident marks, I. Tomb of Erechtheus, J. Athena Polias, K. Hermes, L. Lamp of Kallimachos, M. Persian Spoil, N. Caryatid Porch.

III. Pandroseion:
O. Tomb of Kekrops, P. Temple of Pandrosos, Q. Olive Tree, R. Altar of Zeus Herkeios.

1.7

(a–g) The evolution of Greek temples is characterised by a gradual introduction of layers separating the interior from the outside space.

(a) Temple in antis, old temple of Nemesis, Ramsus.

(b) Prostyle temple.

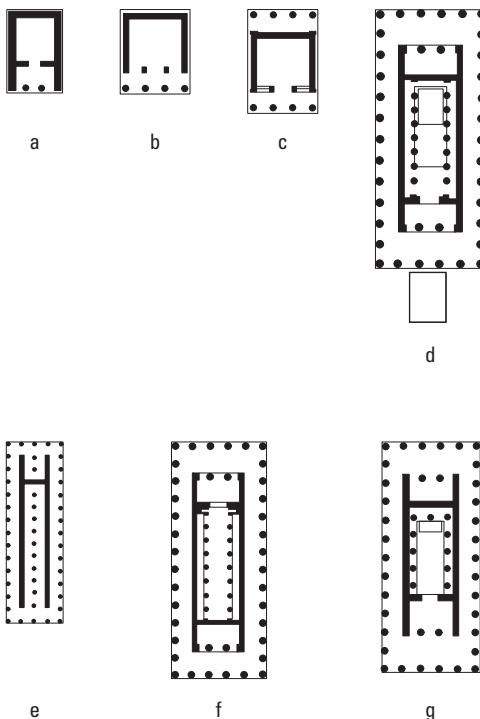
(c) Amphi-prostyle temple,

(d) Peripteral temple.

(e) The temple of Apollo at Thermum.

(f) The temple of Poseidon at Paestrum.

(g) The temple of Hephaestus at Athens.



invariant in this evolution point to four distinct types: first, the temple *in antis*, where the side walls of the naos project outwards, enclosing two columns and forming a porch (Figure 1.7a); second, the *prostyle* temple with four columns at the entrance defining a portico (Figure 1.7b); third, the *amphiprostyle* temple, where the front portico is repeated at the back of the building (Figure 1.7c).² The fourth type is the *peripteral* building in which the naos with its porches is surrounded by the peristyle, as in the Parthenon and the Hephaesteion in Athens (Figure 1.7d, g). The interior also developed from a single room to a colonnaded space. At the beginning there was a single row of columns (Figure 1.7e), then two rows placed on either side of the central axis (Figure 1.7f), and finally a continuous colonnade that surrounded the god's statue (Figure 1.7g).³

The introduction of layers around the naos increased the depth between inside and outside. Spatial depth in religious buildings establishes a categorical distinction between the interior and exterior space. At the same time the axis coordinates the spaces arranged along its course and synchronizes the realm of the god with the human domain (Hillier and Hanson: 1984: 181). The peristyle wrapping around the naos and the porches eliminated distinctions between the front, the back and the two sides. When parts in a composition become similar, the mind can access the simplicity of the whole. The Greek monuments were positioned obliquely so that a single viewpoint was enough to capture their order. Their significance in expressing the deity was in their external appearance, as the interior was designed for the purpose of ritual and not for social assembly. Becoming legible through stasis

rather than movement, they seemed to emphasize their conceptual unity over the diversity of views obtained through embodied experience.

So, whereas the Parthenon is regular and known through stasis, the Erechtheion is irregular and can become understood only through movement. Both temples contained images of the goddess Athena, a colossal new statue made by Pheidias and an old wooden goddess whose origin reaches back to Mycenaean times. At that time wooden statues ('xoana') were bound by ropes and chains to prevent them from fleeing (McEwen 1993: 5). If a memory of the necessity for fixing the gods had survived among the sculptors and the architects of Athens, then animated life and fixity had found their respective means of expression in the two temples.

Space, form and embodied experience

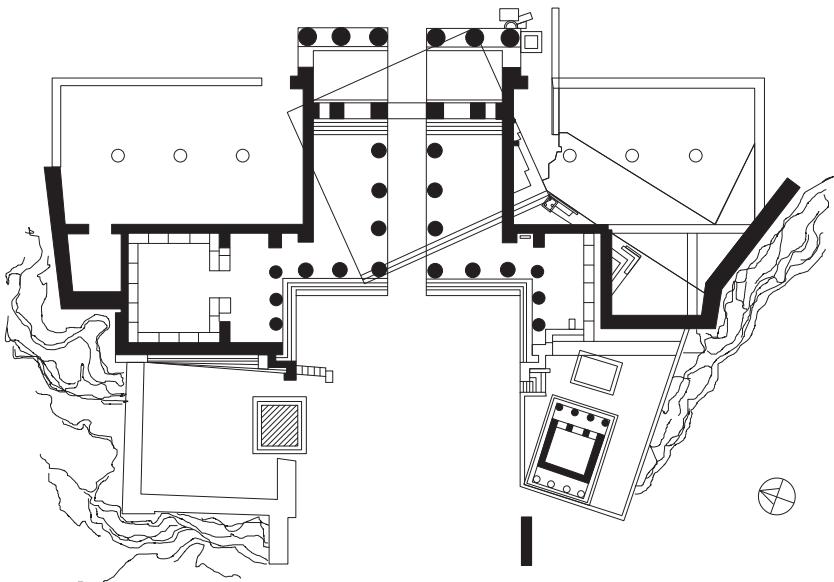
The discussion now turns to the morphological characteristics of the two buildings and their position in the Acropolis. It is well understood that ideas like frontality, axiality and alignment in archaic and classical Greece were of little significance in the relations among buildings. However, at the front part of the Acropolis the axis is acknowledged and erased at the same time (see Figure 1.8). The central structure of the Propylaia is turned 23 degrees so that its axis coincides with that of the approach ramp (Coulton 1991: 120). The picture gallery (*Pinakothike*) is orientated in the opposite direction, with its façade at right angles to the main building. A matching façade lies directly opposite, extending towards the small temple of Nike Apteros at the top of the bastion. Everywhere else in the Acropolis axes proliferate, organizing individual buildings but they had no historic significance in co-ordinating the relationships of the structures with each other and with the entire complex.

Visitors become aware of the asymmetries of the Propylaia at the end of the ascending route. A reconstruction by Stevens captures the view from the entrance (see Figure 1.9). At the front was the statue of Athena *Promachos*, placed at the end of the central axis but turned slightly to the south-west. To the right was the wall enclosing the sanctuary of Artemis *Brauronia* and the *Chalcotheke*.⁴ Behind this wall was the Parthenon, with its lower half hidden by the intervening structures. At the far left side was the north portico of the Erechtheion, the only part of that temple fully visible from the entry sequence (Figure 1.3). The Parthenon dominated vision but did not expose the routes leading to any of its two entries. The Erechtheion was hardly visible, but it was clear which route would be used to reach its north entrance.

The drawings produced by Auguste Choisy indicate that he walked along the main path between the Parthenon and the Erechtheion. Using those drawings the filmmaker Sergei Eisenstein attributed the origins of montage to the embodied experience of the Acropolis and to a dialogue between the two temples (Eisenstein 1987). Le Corbusier also referred to these illustrations to discuss the two structures. But the only written source in terms of the ways in which the Acropolis was seen in ancient times is by Pausanias, a Greek traveller in the mid second century AD, who in his *Guidebook to Greece* takes the same route followed by these writers.⁵ Yet, the rituals associated with the Erechtheion indicate that it was the north path

1.8

Plan of the Propylaia.



1.9

View from the Propylaia, reconstruction by Stevens.



that featured most prominently in the religious use of the sanctuary rather than the route between the two buildings. The Panathenaic procession terminated at the Erechtheion with the offering of the newly woven robe ('*peplos*') to Athena.⁶ Two maidens called *Arrephoroi* lived in the building north-west of the temple and carried Athena's sacred baskets from there to the shrine of Aphrodite through an underground passage (Pausanias xxvii, 1–3, 3–6).

There is no evidence regarding the cults associated with the Parthenon that enable identifying one of the two paths as the dominant means by which one



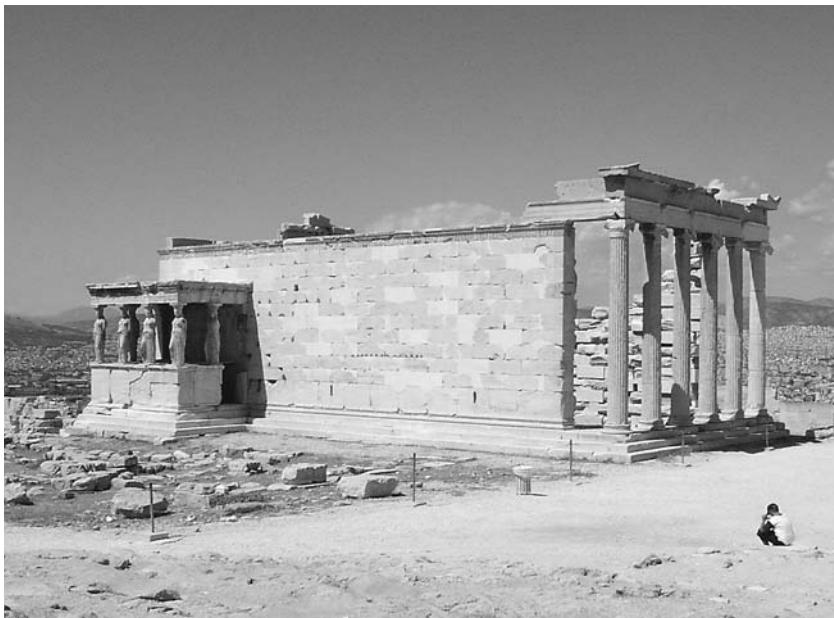
1.10
The Parthenon,
reconstruction by
Stevens.

would access these temples. However, the architectural and sculptural efforts that converged in the precinct suggest that, in addition to serving religious rituals, it was the site of a 'huge public votive offering of political and religious significance', as well as a treasury with numerous shrines and sculptures (Korres 1994: 56). Another reconstruction by Stevens depicts the Parthenon from north-west with a concentration of offerings (see Figure 1.10). The route leading from the Propylaia to the Erechtheion was also lined with statues. Pausanias must have felt overwhelmed by the wealth of statuary that was available for description and devoted only a paragraph to the Parthenon sculptures.⁷ 'But my narrative must not loiter as my task is a general description of all Greece,' he remarked before reaching the Erechtheion (Pausanias xxvi, 3–5).

We will adopt his route, the route of a visitor, instead of that associated with the religious rituals performed in the sanctuary. If we extend the left side of the retaining wall behind the statue of Athena *Promachos*, the point where the line meets the central axis crossing the Propylaia defines the location after which the portico of the Erechtheion would cease to be visible (Figure 1.3). Attention would focus on the towering figure of Athena slightly turned to the right. This is the second moment after the Propylaia where asymmetry offered a direction, pointing towards the path between the two structures. From the sanctuary of Artemis or from the *Chalcotheke* court, the Erechtheion was largely invisible. It would appear again from the top of the Parthenon's base or from the middle of the road. The view comprised the Caryatids porch against a blank wall. At the end of this route was a different view of the building, showing its symmetrical porch at the east side (see Figure 1.11). Arriving at the narrow stretch of land between the temple and the northern edge of the rock, visitors could look back at the Propylaia (Figures 1.3, 1.5b). To the left was

1.11

The Erechtheion,
view from south-
west.

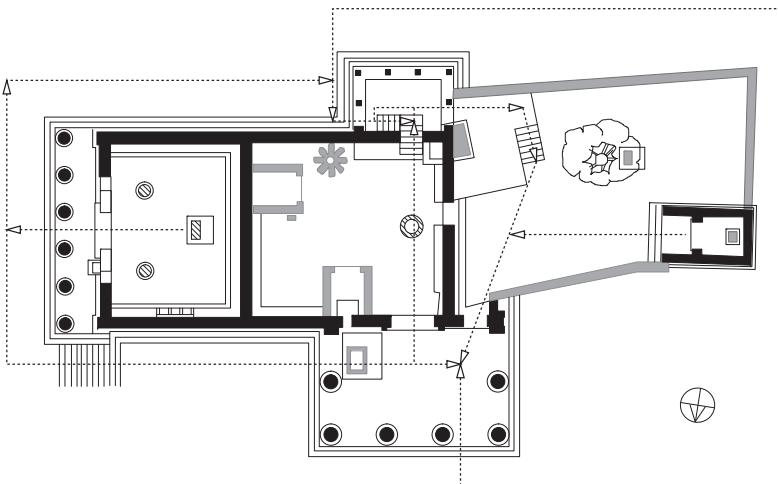


the sanctuary of Pandrosos, while the exit road was lined with Pausanias' last series of statues. But at this point the viewer would have come full circle and be able to glance back to the beginning of the sequence.

Thus the entrance to the profane part of the Acropolis was 'symmetrical' with the entrance to one of its temples. In contrast, the Parthenon entrances were hidden and could be accessed through a set of intervening spaces and changes in direction. Visitors would be exposed to numerous narratives from sculptures and shrines along their route, but they would also assimilate a larger narrative consisting of the two buildings and their relative positions in the precinct. The Parthenon dominated the experience through its invariable image and distinguished itself from the rest of the sanctuary through its segregated and concealed entries, while the Erechtheion had a clearly visible entrance and was easily accessible. The shifting sequence of appearance, disappearance and changing faces from the approach route indicated a negotiable identity, both secular and divine.

It was not only the irregular appearance of the Erechtheion that animated the experience, but also the circuitous route through its porches and chambers (see Figure 1.12). It is not certain who gained access to the temple or to the sanctuary of Pandrosos. Pausanias visited the interior and gave a description that is curiously long compared to the short account he provided of the Parthenon sculptures. But no matter who entered or who did not, the west part of the building was so perforated with openings and doors that it was possible to wander from the inside to the outside and from one room to the other without the need to retrace one's steps or cross the same space twice.

If we compare the circulation loops in the Erechtheion with the axial route across the spatial layers inside the Parthenon, we see another contrast between the



1.12
The route structure in the Erechtheion. The route consists of circulation rings that pass through the interior and the exterior.

two temples. The Parthenon is protected from casual accidental movement across its boundary that might undermine its stable image. The temple of Athena *Polias*, which Homer calls the 'house of Erechtheus' (*Odyssey* vii, 81), has none of the formality of its neighbouring building.⁸ Its courtyards, porticoes and perforated chambers indicate a weak distinction between the divine and daily life. In the Parthenon the formal nature of the approach route and the central axis corresponds to the imposition of a single compositional logic that prevails over the rest of the elements expressed in the peristyle. In the Erechtheion the informal spatial link of the north portico with the Propylaia and the circuitous route connecting interior and exterior match the absence of a dominant set of principles in its volumetric design.

Vincent Scully notes that the irregularity of the Erechtheion complements the 'Parthenon's singleness'. Their relationship establishes an axis that intersects the long axis from the island of Salamis to the mountain of Hymettos, placing the two buildings in a larger geographical context (1962: 182). Scully's interpretation together with Eisenstein's notion of montage implies that the content of the two buildings emerges out of their interrelationship. But it is also essential to explore their morphological properties in relation to their mythical, cultural and political contexts. This exploration can further illuminate the difference between a stable and a negotiable identity that emerges from the morphological study.

The mythic and sculptural narrative

Athena was patron of Athens and the Acropolis was her sacred hill. However, like the building axes that proliferate, but never offering an overarching view of the whole, from diverse vantage points the precinct offers alternative forms of the goddess. Athena *Promachos* and the colossal statue of Athena *Parthenos* made by Pheidias depicted her in martial armour. An ancient holy figure carved in olive wood known as Athena *Polias* was in the Erechtheion. There was also Athena goddess of Health (*Hygieia*) situated at the south side of the Propylaia and, finally, Athena *Lemnia*, a gift from the island of Lemnos, located on the north route to the Erechtheion.

Pausanias found this last Athena the most beautiful of all (xxviii, 1–4). But, from the cascade of images currently available of the goddess, one shines more brightly than others: Athena *Parthenos*, the gold and ivory statue, which is the only one of the five statues he refers to in detail (see Figure 1.13). According to Margaretha Lagerlöf this statue is an expression of Athena's greatness, 'an image treasured within the Parthenon as in a lovingly prepared casket'. On the other hand, she claims that the old wooden figure represented the goddess' 'presence and essence' (Lagerlöf 2000: 160). Which among all forms of Athena was this essence? If this essence was in her capacity to change form, then surely this was the nature of gods in Greek religion, a nature that the changing surface of the Erechtheion was capable of sustaining. But if Lagerlöf uses Plato's definition of essence, to whom she constantly refers, we have to go beyond appearances to a realm 'where the bodiless prototypes were at rest: the world of ideas' (Calasso 1994: 130). And where else could an idea, or essence, find better manifestation than in a stable image: the Parthenon?

It is all a matter of interpretation. The question is not *what* the images actually represented but *how* they did so in the context of the architectural, sculptural and religious system. This difference is important as it illuminates the transient nature of the sign and saves its significance from fixed and literal meaning (Levi-Strauss 1963: 210). But whereas the content of the Parthenon sculptures has been widely argued, the contribution of architecture to its expression is largely absent from the debate.

Pausanias' brief description has helped scholars to picture the three kinds of sculpture that were knit into the Parthenon (Beard 2002: 29). Sculpted in full relief on the pediments were scenes associated with Athena. The west pediment showed a local myth: her victory over Poseidon for the patronage of Attica, with Attic characters as judges of the divine gifts, Athena's olive tree and the salt spring of Poseidon. On the east pediment was her birth from Zeus' head among an assembly of the Olympian gods. Carved in high relief on the metopes were subjects of battles with Lapiths and Centaurs (south side, see Figure 1.14), gods and giants (east side), Athenians and Amazons (west side), Greeks and Trojans (north side). Finally, the scene carved in low relief along the frieze depicted a procession that moved northwards along the west and eastwards along the north and south sides (see Figure 1.4). The two parts of the sequence rounded the north-east

1.13

The gold and ivory statue of Athena, Varvakeios copy.





1.14
Metope, south face
of the Parthenon,
battle of Centaur
with Lapith.

and south-west corners, converging at the centre of the eastern boundary (see Figure 1.15). The Parthenon frieze is considered a tour de force of planning and carving and continues to generate a range of interpretations. The most prevalent explanation is that it represents the Panathenaic procession that terminated at the Old Temple, carrying the newly woven *peplos* to Athena (Beard 2002: 133).

The vast scholarship and interpretations these sculptures have attracted converge on one argument: their content integrates history, politics and myth portrayed as a tension between struggle and victory. The mythical battles of the Greeks and their gods over eruptive powers on the metopes allude to the Persian war and to Athenians as defenders of freedom and social order (Harrison 1974: 226). Athena's victory on the west pediment venerated Athens, as did her birth from Zeus' head at the pediment on the opposite side. 'Athenians and their sacred rock were to Athena as Athena was to Zeus and Olympus' (Lagerlöf 2000: 3).

The subjects on the pediments and the metopes were pan-Hellenic and had recurred widely in diverse contexts. However, the narrative plot reached back in time and, in a Homeric spirit, integrated the memory of major historical and mythical events in one building: the consolidation of the world by the gods' victory over the giants, the unity of all Greek cities in the fall of Troy, and the triumph of Greeks in the Persian war.⁹ The characters, many of which were Attic, Athena's

1.15

East side of
Parthenon frieze,
Olympian gods.



crowning presence, and the Attic ritual in the frieze alluded to the political superiority of Athens after the Persian defeat in the rivalry over the Greek cities. The synthesis of aesthetic, social and religious values and the appropriation of pan-Hellenic subjects in the Parthenon advanced a single ideology and a political propaganda for the citizens of Athens.

The scenes carved on the Erechtheion's frieze did not survive, but the cults and sacred sites it housed constructed a narrative that was associated with that of the Parthenon but of an entirely different kind. The building adjoins the remains of a Doric temple. Originally a Mycenaean palace stood on the site, the palace of Cecrops – the first king of Athens – and of Erechthonios often combined with Erechtheus according to Greek myth. The complex myths associated with the Erechtheion reach back to Erechthonios, who was born from an unsuccessful desire of Hephaestus for Athena. Hephaestus' seed fell in Athens and accidentally fertilized Earth ('Ge'). Athena took charge of the child who had a serpent's tail for legs,¹⁰ placed it into a basket and gave it to Aglauros, the eldest daughter of Cecrops.¹¹ Aglauros and her sisters were curious and broke the sacred order, looked under the lid and leaped from the Acropolis out of fear. The child found refuge in Athena's aegis (the Gorgon-goat's skin) and later became king of Athens, instituting her worship and the Panathenaia. The Athenians saw themselves as descendants of Erechthonios-Erechtheus, so loved by Athena that he was mistaken for her child (Graves 1960: 98). They had the paradoxical dual identity of autochthony (born from the earth) and divine birth, like that of their ancestral goddess, who was both virgin and mother.

In Euripides' play *Ion*, Erechtheus is the descendant of Erechthonios and is thus a different character. According to Walter Burkert, Erechtheus and Erechthonios are merely variants. 'It was only Erechtheus that was used in cult as it has the original non-Greek name, while the name of Erechthonios was a Hellenizing neologism because of the etymology' (Burkert 1983: 156).¹² The Attic myth differentiates

between the two by telling of Erechthonios' birth and Erechtheus' death, indicating that the former is the child born from the earth who later becomes Erechtheus, the king of Athens. The latter died in the battle between Athens and Eleusis, rammed into the earth by Poseidon's trident. However, Erechtheus and Poseidon, 'victor and vanquished', became two names for a single god: Poseidon-Erechtheus. Euripides described the events leading up to his death in the tragedy *Erechtheus*. The drama merged the two characters, recognizing the symbolic unity in the polar tension of sacrifice (1983: 149).

Such was the complexity of ancient myths associated with the site that each one of its spaces was marked by mythic significance. Pausanias refers to the altars of Poseidon-Erechtheus, Hephaestus and Boutes (hero of Athens) at the east side, and to the holy image of Athena, a wooden Hermes (said to have been dedicated by Cekrops), a golden lamp (where Hephaestus' fire burnt on Athena's olive oil), a chair made by Daedalus, relics from the Persian war, the sea-water well and the olive tree produced by the goddess in the contest with Poseidon on the west.¹³ Adjacent to the tree was the tomb of Cekrops as well as the shrine of his daughter Pandrosos (see Figure 1.6). Finally, a square aperture in the floor of the north portico indicated the marks made on the rock by Poseidon's trident in the contest, while an aperture on the roof suggested a spot struck by the thunderbolt of Zeus (xxvi, 5–7; xxvii, 1–3).

Architecture shaping narrative

Greek mythology is an inter-textual tapestry of poetry, art and oral tradition. Myth is interwoven in variations, deriving its meaning from its position in the totality of representations. Its constituent units have a stable pan-Hellenic character as well as a variant expandable nature, based on their general or particular significance according to circumstance. Athena in the Parthenon had the pan-Hellenic identity of the warrior. In the Erechtheion she had an Attic and multifaceted character (warrior, virgin and mother) and shared her premises with gods, kings and their families that were mortal and immortal, autochthonous and divine.¹⁴

Her epiphany in her 'house' was local and ritualistic, while in the Parthenon – her stable monument – her deeds became global and panoramic. The Parthenon embodied narrative pictorially through sculpture; the Erechtheion mediated archaic myths through spaces and fragments. Each pictorial level in the former corresponded to a different phase in the divine and human history,¹⁵ from Athena's birth (pediments) to Homer's epic, where the gods joined the heroes in acts of procreation (metopes), and finally to fifth century Athens where mortals achieved heroic status, joining the gods at the east side of the frieze (Figure 1.15).¹⁶ Time in the Erechtheion did not extend from a remote past to the present. On the contrary it remained fixed in the Bronze Age.

Seen individually, the pediments and the metopes captured a single moment of divine and heroic action. In contrast, the frieze represented action in a temporal sequence. Philipp Fehl suggests that the Panathenaic procession was shown as a contemporary might have seen it on the way to the Acropolis (1974: 314). Separate moments at different parts of its course, from the preparations of

the horsemen in the outer Cerameikos to the arrival at the precinct, were selected and represented as a continuous progression (see Figure 1.16). The characters from various classes were grouped so as to correspond to the organization of the Athenian state: 'in fact, the groups reflect the successive forms of that organisation, with the earlier system on the north side of the temple, and the more recent, the democratic system on the south' (Korres 1994: 58). The co-existence of separate moments along the course of the procession shows a compression of linear time, the time it takes for a single ritual to complete. The co-presence of citizens from different political periods shows a compression of cyclical time, the time during the course of repeated processions. So, in spite of the organization of the events into a sequence, the depiction of action on the frieze had also a simultaneous effect. It translated different moments of historical time into narrative time and synchronized them into a progression on a finite physical surface.

The sculptural ensemble as a whole had a temporal orientation, from a remote beginning to a distant past and an immediate present. For Claude Levi-Strauss, myth consists of all its versions (1963: 217). Telling a myth involves a successive reading of events that unfold diachronically. Understanding it, however, involves disregarding the diachronic dimension and focusing on the vertical links among the mythic units. The structure of myth thus consists of occurrences of similar relationships embedded in each variant. The overall theme of struggle and victory in the Parthenon sculptures and the compression of time in its frieze enabled vertical associations. So, the Parthenon sculptures show a systematic attempt to map myth as a synchronic and stable system. If the war of mortals in the Persian Wars could be thought of as analogous to the divine and heroic battles, their passage from human life to the eternal world of timeless values was deemed to have occurred. If the pan-Hellenic and Attic scenes had jointly prefigured the force of Athens in the fifth century, the city was not an ephemeral and variant instance in myth and history but a fundamental ingredient of its entire structure. It was not possible to perceive this structure from a limited viewpoint, so movement was essential to absorbing its meaning. However, the conceptual unity of the building mirrored the universal and panoramic message of its sculpture, enabling the viewer to connect the narrative units into a single comprehensible corpus.



1.16
West side of
Parthenon frieze.

In the Erechtheion, myth had neither an imposed conceptual order that integrated events nor a simple and unified physical body for its inscription. It was based on archaic Athens and used embodied experience as its instrument of narration. The movement of a person around and through the building was the medium that related the emblems that punctuated its spaces to each other. Objects and spaces stood in close proximity and in a loose relationship to each other. The myths they instigated with their complex origins and genealogies relied upon the varied routes to reveal their open-ended message. The Erechtheion engaged the variant nature of myth rather than its synchronic structure. This aspect of myth was relevant to the design of the building that honoured the changing nature of embodied experience rather than an overall concept. The two temples and their differences, regular and irregular, formal and informal, visible and invisible, carried oppositions between their respective stories, like universal and particular, generic and variant, contemporary and archaic.

The architecture of politics and place

Conflicts in myth and art, such as those mentioned above, are used to solve problems that remain insoluble at the empirical levels of experience and practice (Levi-Strauss 1963: 210). At the level of social practice the building programme provided steady employment and strengthened the sense of accomplishment and public pride. But behind the unified efforts that converged on the Acropolis was a political friction. Each side in the debate might have placed its hope or fear on what lay behind the city's monumental glorification: the economic and social empowerment of tradesmen involved in the programme and their vote in the demos (Meiggs 1972: 109). However, Pericles resisted the objections to using funds contributed by allied cities for military protection, with the intention to celebrate the identity of the city.

The celebration of Athens was in complementary relations, implying a different conception of its identity in space and time. The Parthenon pointed to those characterizations that gave it a universal dimension; that is, an association with the totality of myth, history and space. In contrast, the Erechtheion referred to the specific and local nature of myth, time and location. Studying the relationship between spatial properties, social relations and cultural meaning, Hillier and Hanson suggest that entities that operate across space are 'universal categories' with a 'transpatial' dimension. In contrast, those that are identified with a specific region rely on spatial proximity to realize their operation (1984: 20). Stretching across time and space, the Parthenon protected its categoric identity by interposing spatial layers between its boundary and the domain of mortal existence and through its stable formal appearance. Linked to a particular spatial and temporal instance, the Erechtheion was easily accessible and negotiated its identity by its irregular form and direct relationship with the space of daily life.

Both buildings show a specific conception of identity, but they move in opposite directions. The Parthenon reinterprets the past for the eyes of a timeless present, and for a sphere of influence that exceeds the city's geographical limits. The Erechtheion is a 'natural' extension of a timeless past mapped by geographical and topographical boundaries that are limited and specific. Through the former, Athens

advances an *empire* and a *state*. Through the latter, it celebrates a *mythical locale*: an autochthonous population and a *place*.

Tradition and innovation

In the Western world of architectural Humanism, whose roots are being discussed here, we are accustomed to associate formality and symmetry with notions that have been stabilized traditionally through time. In contrast, asymmetry usually stands for a disruption in the existing systems of thought and building practice. It is reasonable, then, to expect that a new social order, such as democracy and empire, would find expression in a new or unusual form, such as the Erechtheion, based on asymmetry and direct accessibility, rather than through symmetry and spatial segregation. Similarly, an old ritual rooted in the aristocratic past like the Panathenaic procession could have taken place in a building like the Parthenon that, regardless of its innovations, was closer to the conventional temple design. Thus morphological principles have meaning in terms of the internal logic of their relationships. What these principles come to signify in different cultural environments, however, can be understood only in relation to their cultural and historical contexts.

To discuss these characteristics it is proposed to start by looking at the events that led to the building work. Lycurgus quotes an oath said to have been sworn by the Greek allies at Plataia in 470 BC: 'Of the shrines burnt [by the Persians] ... I will rebuild none, but I will allow them to remain as a memorial to those who come after the impiety of the barbarians' (Wycherley 1978: 106). Thirty years later Athens had recovered from the Persian wars and gained the economic resources necessary to start the reconstruction. War scars are covered either to facilitate oblivion or to advance new kinds of collective memory. The more the changes witnessed after the wars broke with the city's past, the more likely it was for the scar to show an undesired break. Contemporary achievement and innovation needed historical depth to express themselves as the natural outcomes of a noble nation.

What were these achievements and how did they affect the city's image? The transformations in Athens in the fifth century BC made the shift from internal politics to foreign relations, from an agrarian society to manufacture, economical enterprise and urbanization, and from military power to imperial expansion and naval warfare (Raaflaub 1998: 15). They brought numerous opportunities for business and economic gain and facilitated the change from tyranny to a democratic state. The citizens of Athens developed a political identity that shaped their thinking and behaviour. They had a collective sense of accomplishment and a faith in their power to control their destiny through participation in the political process (1998: 21).

These changes brought a democratic conception of temporality. But they did not occur without ideological conflict, as many of the city's aspects were still attached to the aristocratic notion of time. Democratic temporality privileged the present over the past, historical cause over inherited values, individuality, innovation and human choice over ritual, repetition and genealogy. In contrast, the old temporality was structured upon lineage, the mythical orientation of the past, and the reproduction of archetypal systems and paradigms (Csapo and Miller 1998: 98).

This new conception of time was reflected in politics and other cultural

developments such as naval war, rhetoric, law, historiography, individualism and realism in sculpture and drama. However, in spite of discoveries, the storehouse of myth continued to supply the arts with thematic content. Only very rarely did artistic expression make direct reference to contemporary achievements. In contrast, it alluded to their significance using parallels from the past. Similarly, funeral orations and forensic speeches developed mythic parallels to ground contemporary institutions and ideals (Boedeker 1998: 190).

On the Acropolis and elsewhere the new civic identity was reaching back in search of the heroic tradition. But at the same time the 'old' identity was joining the effort. Autochthony through the birth of Erechthonios became a favourite subject in fifth century BC vases, reaching the highest level of popularity in the Peloponnesian War years (Shapiro 1998: 133). Democracy and the leadership of the alliance could thus turn to an inherent characteristic, a natural outcome of a race so noble and so distinguished that even the gods would fight each other for its patronage and protection.

The ideological labour of reinstating tradition becomes significant in periods where transformations in spatial and temporal practices are seen as undermining the sense of historical continuity, resulting in a loss of identity of place. Thus, inventing tradition became significant in the nineteenth century through preservation, the emergence of museum culture and the discovery of antiquity and ruins (Harvey 1990: 272). Notions of heritage, place, regional identity and an emphasis on sustainability are contemporary phenomena, counteractions to the intense compressions of space and time brought by consumption, mobilization and international markets. For a Greek community in the classical period, where human knowledge and collective memory were deeply rooted in the universe of myth, it was the new identity that needed support rather than the living tradition. From architecture, painting and sculpture, to politics, poetry and drama, Athens celebrated the past to reinforce and strengthen a radical present.

Spiritualising politics, secularising tradition

As you enter the temple that they name the Parthenon, all the sculptures you see on what is called the pediment refer to the birth of Athena, those on the rear pediment represent the contest for the land between Athena and Poseidon (Pausanias xxiv, 3–5).

This is all that Pausanias left us concerning the Parthenon's sculptures as opposed to his long and detailed description of the Erechtheion. His writings were for the leisurely satisfaction of the average visitor, while his account of Greece avoided the appearance of cities, buildings and landscapes as well as the artistic value of paintings and sculpture. His vast account of sanctuaries and statues was interrupted by digressions to associated legends and stories, accompanied by a 'voracious appetite' for genealogy and names (Jones 1998: xiv). The world Pausanias calls *ta Ellinika* (Greek matters) is less about the visualization of places and objects and more about the stimulation of collective memory through history and oral tradition. Athens had

lost its political power but not its storytellers. In a period of international Greek culture handed down by Hellenism and sustained by the Roman Empire, the Erechtheion and its cults retained their mythic significance. It is perhaps for this reason that Pausanias, more curious about tradition than artistic expression, provided a description of the Erechtheion longer than that which contemporary art historians might expect.

Six hundred years earlier storytelling had grounded the building and the city's image. Onians suggests that the architect of the Erechtheion built the maidens porch (see Figure 1.17) as a representation of the structure on the Lion Gate at Mycenae, to recall the palace of the Bronze Age rulers of Athens. In the context of Greek city-states Athens was an exception, as its Ionic origin and palace culture had survived the Doric invasion. Like Euripides' drama *Ion*, which made the founder of the Ionian race a grandson of Erechtheus, the Erechtheion was intended to show Athens' Ionian allies the home of their common ancestor (Onians 2002: 60). Through epics performed in the Panathenaia and myths interpreted through dramas, audiences might have made a connection between the Mycenaean palace in Euripides' plays and the 'house of Erechtheus'. There were other instances when Athenians looked either for notary evidence of their presence in the Homeric epic or analogical reference in various myths. Onians' suggestion casts light on the interpretation of the two temples as a contrast between politics and religious tradition. In the Erechtheion Athens promoted its autochthonous identity based on archaic myths and rituals. But this identity has also a political dimension. If the Parthenon is the celebration of superiority over the Greek cities based on democracy and the empire, the Erechtheion is an expression of ancestral superiority founded on autochthony.



1.17
The Erechtheion,
the Caryatids
porch.

So, myth was brought to the political service of the city's identity, as it was an essential part of collective memory and a traditional belief system. However, there were difficulties involved in connecting the contradictory roles of myth in the two buildings: myth in the service of democracy, the aristocratic past, religion and daily life; Athens shaping its own destiny in history and Athens in the flow of narrative, place and time. These difficulties were overcome by the assertion that contradictory relationships were no longer contradictory, provided that each of the two buildings embraced its opposite. Expressing democracy and the empire, myth in the Parthenon solidified into permanent stasis. Servicing autochthony and tradition, myth in the Erechtheion acquired a living form, a demonstration of everyday practice. The Parthenon was regular and formal so as to distance democracy from the space of daily action, spiritualize its message and give it universal significance. The Erechtheion was informal in order to secularize tradition and raise it to the level of daily life.

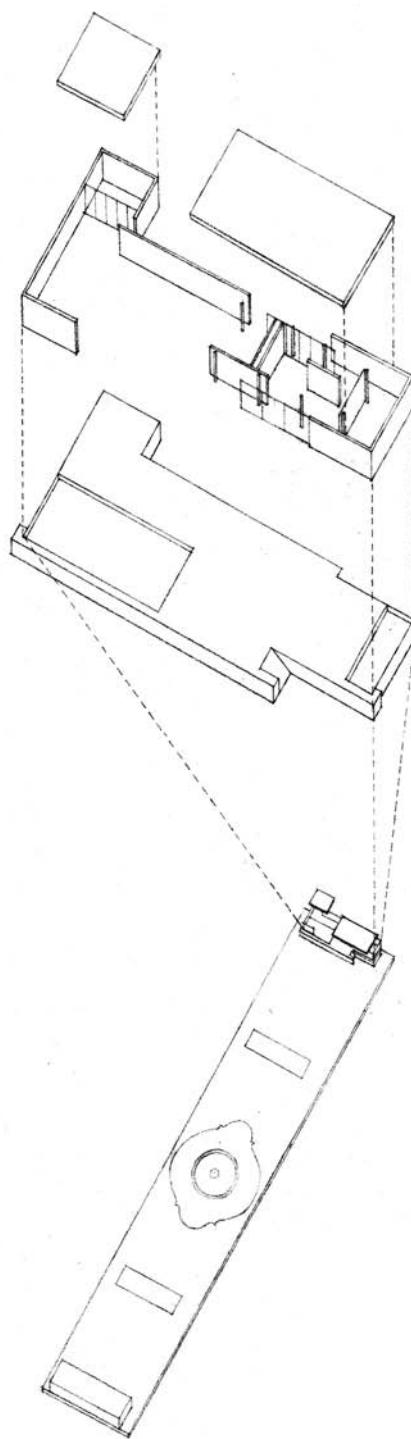
Culture and nature

On the metopes of the Parthenon Athens slays supernatural monsters and so gains access to the gods, who seated in the eastern side of the frieze, watch over the city's apotheosis. But if the cultural desire is to reach the divinity by overcoming nature, nature continues to exercise pressure. In the Parthenon Athens defeats its bond with the soil and stretches beyond the limits of space and time. In the Erechtheion it recognizes the difficulties involved in the realization of such a desire. And so it allows itself both a departure and a return to the home place of Erechtheus, like Odysseus, whose long-standing respect for Athena enabled him to escape Poseidon's rage, nature's unfathomable revenge.

The task in the two temples was to provide a solution to the dilemma of the natural link with the land stretching back to a mythical past and the breaking from this past through cultural innovation. The synthesis of opposites in these buildings demonstrates that politics and religion are not separate practices or conceptions, and that cosmological concepts were used to service both the political and religious message. Most importantly, the contrasting frameworks of the two temples show that the human mind uses a set of logical relations that harmonize conflicting elements of experience, and in so doing is bound to, but irreducible to the facts of the empirical world, or of culture to nature (Levi-Strauss 1963: 216).

Conclusion

The Parthenon's hierarchical arrangement of parts and their corresponding cultural content construct a conceptual and narrative unity. On the other hand, the non-rigid organization of elements in the Erechtheion creates an open-ended message. In the former, conceptual unity dominates the changing aspects of perceptual experience to ensure that the conceptual and the narrative content are understood in only one possible way. In the latter priority is given to perceptual differences, sustaining varied forms of mythical expression. In the Parthenon architecture is the means to the semantic expression of narrative. In the Erechtheion it is the means to interpretive variation.



2.0
Ludwig Mies
van der Rohe,
Barcelona Pavilion.

Chapter 2

Invisible surface

Reflections in Mies van der Rohe's Barcelona Pavilion

We know no forms, only building problems. Form is not the goal but the result of our work ... Form as goal is formalism; that we reject. Nor do we strive for a style. Even the will to style is formalism. We have other worries. It is our specific concern to liberate building activity from aesthetic speculators and make building again what alone it should be, namely BUILDING [BAUEN].

– Mies van der Rohe, L. Second issue of *G*, September 1923.¹

In his review of the ideas that influenced the critical history of the Barcelona Pavilion, Juan Pablo Bonta suggested that architectural criticism took a long time to develop a verbal framework to describe its meaning (1979: 138) (see Figure 2.1a, b).² Once an interpretive system was established the Pavilion was elevated to the twentieth century's most significant building. But in spite of its qualities being widely accepted, it defied a single interpretation. It was variably characterized as classical, yet modern, a symbolic house and an abstract temple (Padovan 2002: 110), a domestic building (Tegethoff 1985), and a small landscape (Constant 1990: 46). It was a demonstration of Mies' inventiveness and his 'enduring continuity with architectural history' (Dodds 2005: 11), an example of precise construction but of ambiguous tectonic expression (Evans 1997: 244), a celebration of universality (Padovan 2002: 111) and an obsession with visual effect (Evans 1997: 247), the outcome of de Stijl's impact on architecture (Barr 1936: 156) and of Alberti's discoveries in perspective (Evans 1997: 253). Looking at the visual experience of the Pavilion, Evans suggested that it had no overriding system of order based on axial symmetry. However, the reflections on its polished materials restored a symmetry that was removed from its visible surface.

Interpretations of the Pavilion proliferated in the 1960s during its absence and re-emerged in the 1980s and 90s after its reconstruction. Most have depended on a few pictures of the original building: 16 prints made by the Berliner Bild-Bericht company. But from all that has been said some questions remain curiously open: not what it actually means, but how it formulates its meaning. What do its surfaces reflect and what kind of symmetry do they reconstruct in the optical experience



2.1
Ludwig Mies
van der Rohe,
Barcelona Pavilion.



of the building? And, finally, if the Pavilion has risen to an iconic and mythological status by a 'galaxy of words' is it possible to re-illuminate it with fresh mechanisms of description, other than those of language?³

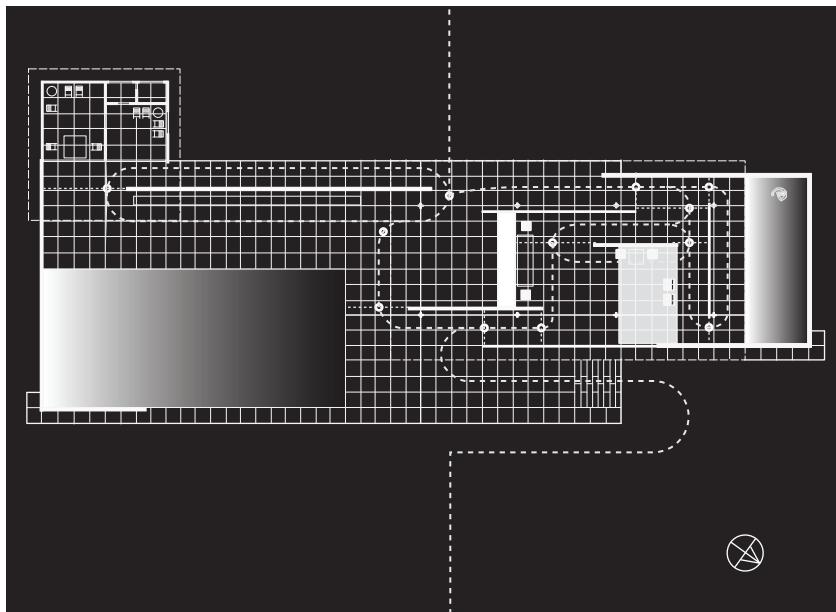
Between conceptual order and visual appearance

As he [Mies] developed the design, he kept drawing the axial line through the plan of the Pavilion, measuring the asymmetries against it (Evans 1997: 235).

Placed perpendicular to the east-west axis of the exposition layout, the Pavilion arrested and diverted movement through its space (see Figure 2.0). The axis traversing the Gran Plaza approached the Pavilion from the front, but the visitor had to change direction to reach the flight of steps that led to the top of the podium at the north-east corner. Another flight of steps led to the centre of the podium from the slope at the back of the site. The two routes circulated around the wall elements, formulating sequences of movement (see Figure 2.2).⁴ Zimmerman suggests that these sequences flow around the planes in contrast to the delimiting condition of the floor and the ceiling (2007: 116).⁵ But the first contrast Mies placed at work was between the symmetry of the plaza and the asymmetry of the building, between the axial line traversing the site and the meandering routes flowing from the inside to the outside.⁶

The contrasts between symmetry and asymmetry, frontality and dispersion, the slicing of space by building slabs and the free course of movement have been identified as some of the main characteristics of early Modernism.⁷ Colin Rowe highlighted the fortuitous qualities of Le Corbusier's Villa Stein against the strictly defined proportions and geometry of its structural organization. Discussing the tension between two ordering systems, one classical based on symmetry, the other modern based on a planned diffusion of focus, Rowe articulated a number of additional conflicts: centrifugal versus centripetal, hierarchical versus egalitarian, intellectual versus sensual, and finally an architecture of static appreciation versus one that foregrounds movement and the changing perceptions of the viewer.

But it is now that this system of horizontal extension which is conceptually logical comes up the rigid boundary of the block which, almost certainly,



2.2

Barcelona Pavilion,
route sequences.
The routes are
drawn by joining
the centres of
thresholds.

is felt to be perceptually requisite; and consequently, with horizontal extension checked, Le Corbusier is obliged to employ an opposite resource. That is, by gouging large volumes of the block as terrace and roof garden, he introduces a contrary impulse of energy; and by opposing an explosive moment with an implosive one, by introducing *inversive* gestures alongside expansive ones, he again makes simultaneous use of conflicting strategies (1984: 12).

In 'Neoclassicism and Modern Architecture' Rowe extended his analysis to a comparison of the early work of Mies and his work in America after 1940.⁸ The International Style, as exemplified by Mies' house for the 1931 building exhibition in Berlin, and Le Corbusier's foyer for the Centrecoyus Building in Moscow, abolished the centre to emphasize a dispersion along the periphery and a composition based on balanced asymmetry. 'Or to paraphrase Gropius, the new demand led to the dead symmetry of the similar parts being transmuted into an asymmetrical but equal balance' (1984: 143).

Rowe placed the Pavilion, which he knew only from photographs and drawings, among the 'representative manifestations' of the 1920s International Style, an example of 'dispersed focus'.⁹ Regardless of the different interpretations most critics converged at a similar observation: the Pavilion exemplified the characteristics of the free plan with the asymmetrical arrangement of the walls and the roof contrasting the regularity of the structural system (Bonta 1979: 140). Zevi regarded it as an exemplar of decomposition, a practice established by de Stijl that analyzed the building volume into individual planes (Zevi 1948: 35).¹⁰ It is a mechanism that broke away from the box, as well as from the co-ordination of the composition through geometrical symmetry. While Classicism had favoured a fixed viewing point, Modernism, as exemplified by Gropius and Mies, replaced a privileged point with multiple viewing positions (Zevi 1948: 33).

The reconstruction of the Pavilion in 1986 led to a new range of critical readings. In his article 'Mies van der Rohe's Paradoxical Symmetries' Evans started his discussion from a premise that is similar to Rowe's analysis, highlighting the difference between the symmetry of the plaza and the irregularities of the building (1997: 235). But he suggested that in spite of its irregular appearance the Pavilion incorporates a number of symmetries that are absent from its visible surface. One type of symmetry is along the horizontal direction with the axis positioned at eye level.¹¹ The second one is in the form of multiple 'reflective' symmetries based on the polished materials. Mies' interest, Evans suggests, was not on conceptual relationships but on the optical qualities of the building. Constant adopted a similar position: 'the meaning of the Barcelona Pavilion is not conveyed through a priori formal logic or the representation of some external reality but is given to sensual and temporal experience', similar to 'the experience of a circuit that suggests parallels with those of the English landscape movement' (1990: 47). But while for Constant the Pavilion does not offer 'rational explication' demonstrating a 'dichotomy between form and perception' (1990: 52, 53), for Evans it has symmetry and coherence. These characteristics are found in visual fields and not in the conceptual mechanisms of

the composition. However, he does not explain what kind of coherence Mies has achieved and how this is possible out of a multitude of reflections.

The claim that symmetry exists in a building that has been unanimously regarded as being about decomposition and rupture of focus raises a number of questions: First, is there a spatial order based on symmetry in the Pavilion? Second, what is the impact of the reflective materials in constructing symmetry and coherence? This chapter describes the characteristics of the Pavilion in terms of geometry, optical fields and what is seen through the reflections.¹² Based on this analysis it argues that Mies uses local geometrical properties to control the visual fields and balances the idea of volumetric decomposition with a perceptually unified interior. But, more importantly, it suggests that the visual effect created by the reflections in the Pavilion question the binary opposition between conceptual order and perceptual experience.

Geometry and optical relations

Searching for an appropriate material for the free-standing partition in the interior Mies chanced upon a large block of onyx dorée, 'one of the rarest and most expensive types of marble'. Because of the particular size of the onyx block Mies was confined to making the Pavilion twice the height of the block (Tegethoff 1985: 77).¹³ This discovery marked a distinctive phase in the design. It affected not only the height of the building but also measurements of the plan 'causing slight alterations to the entire scheme' (Tegethoff 1985: 76). These changes raised the question whether the block had determined the proportions of the entire building. Searching for historical roots in the International Style and fuelled by Rowe's writings on Mies' classicism, critics envisioned that the Pavilion's measurements derived from some kind of module. For Tegethoff, no evidence exists of a proportional system based on fixed units of measurement. On the contrary, mathematical or geometrical correspondences were deliberately avoided. The columns form apses of 6.96×7.70 metres, approximating square areas, while some of the paving slabs were adjusted minutely in size to correspond to the partitioning of the vertical walls and the pillars. The grid had to bend and adjust, responding to a need for consistency at the level of appearance rather than at the abstract level of geometrical order.¹⁴ The architects involved in the reconstruction of the Pavilion reached a similar observation: 'It is just as true to affirm that for Mies in the Barcelona Pavilion there was, as we have said, no single module, and in fact there was a separate modular network for each of the materials used' (de Solà-Morales, Cirici, Ramos 1993: 13).

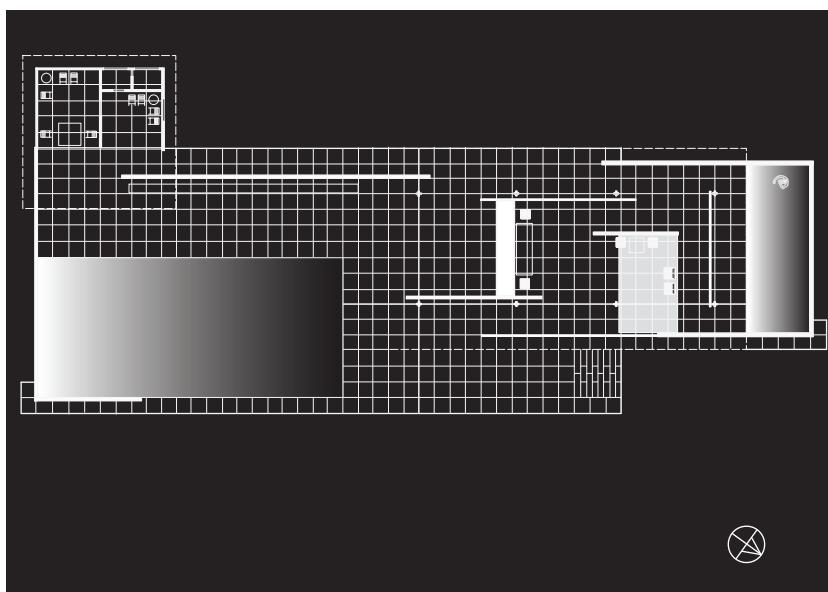
In spite of the absence of geometric co-ordination, the onyx wall was often seen as the symbolic centre of the composition. This interpretation was in some cases derived from the free-standing nature of the wall and from the rich and rare material that created a centre of interest.¹⁵ A second explanation was based on an association between the wall and the symbolic centrality of the hearth in the prairie houses of Frank Lloyd Wright (Frampton 1992: 165). A third interpretation was that the wall had a 'central' position because of the ritual carried out in front of it in the opening ceremony of the building (Quetglas 2001: 141).¹⁶

But since no proportional or geometrical correspondences were at work,

why was the onyx wall loaded with the centrality that was absent from the design? According to Tegethoff the discovery of the onyx block meant that the drawings could be finalized, moving from a state of unrest to a final solution (Tegethoff 1985: 77). So it played a crucial role in the design, determining its completion. But if its significance was in determining only the height of the building, why did it cause changes to the plan, affecting not only the vertical but also the horizontal dimensions?

The plan of the Pavilion gives nothing away as to which geometrical strategy determines the position of columns and planes. The dimensions of the paving slabs were adjusted to fit the columns and the partitioning of the walls, while the end points of surfaces were not lined up in an orthogonal system of lines (see Figure 2.3). However, a closer look reveals certain kinds of regularity. First, the onyx wall occupies the central axis of a large rectangle defined by the extension of the perimeter lines. Second, the translucent box is situated on the axis of a second rectangle defined by the right side of the podium and the left edge of the roof plane (see Figure 2.4). Although engaging only part of the plan, the two centralities establish the distinction of the onyx wall and the translucent box from the rest of the building.

A closer look can reveal a second level of correspondences. The end points of the onyx wall are lined up with diametrically opposite corners and the end points of partitions. These regularities indicate that the discovery of the block caused not minor but major adjustments in the design. Apart from the height of the Pavilion, it determined the width of its footprint, the position of the translucent box, the end points of the glazed surfaces, each marking an entrance, and the location of the bracketing walls at the two ends of the building. There were no overall rules that linked all parts into a shared system of modular or geometric constraints. On the contrary, the horizontal and vertical planes look as though they could slide freely

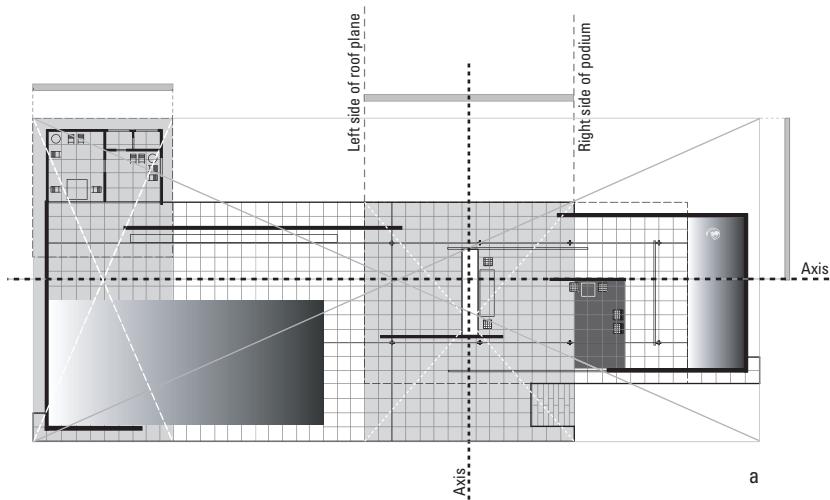


2.3
Barcelona Pavilion,
plan.

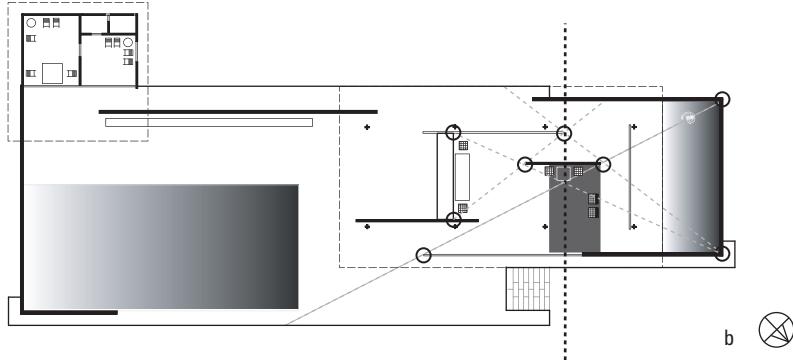
2.4

Barcelona Pavilion.

(a) Diagrams of geometric relations.



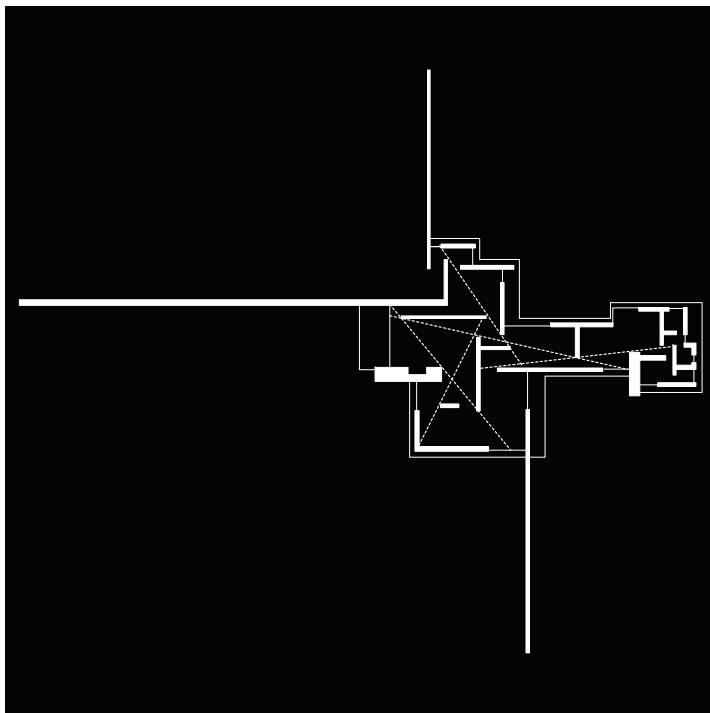
(b) Geometric-visual lines.



in an orthogonal matrix of lines. But in reality they are triangulated, immovable and fixed, showing that nothing was independent or incidental in the design.

A look at other houses by Mies shows that the alignment of spatial corners and the end points of surfaces is a recurrent characteristic (see Figure 2.5). In the Brick Country House diagonal lines link areas that seem to have been broken down to form jigsaw puzzle tokens of space. These lines just about manage to stretch tangent to wall edges that approach each other in tight arrangements. Mies' effort was equally divided between achieving spatial fragmentation and visual integration, allowing the visual axes to reach the extremities of the house. But in the Pavilion a greater interconnectedness of the spaces in the plan suggests that the diagonal axes served a different purpose. They were not there to link separate regions of space, as there is enough room for more than one set of oblique axes to establish visual connections.

The Barcelona Pavilion has been interpreted as a prototype for Mies' houses (Tegethoff 1989: 86). Free-standing walls, cruciform chrome columns and reflective materials became the essential elements of his mid-1930s compositions.



2.5
Ludwig Mies van
der Rohe, Brick
Country House.

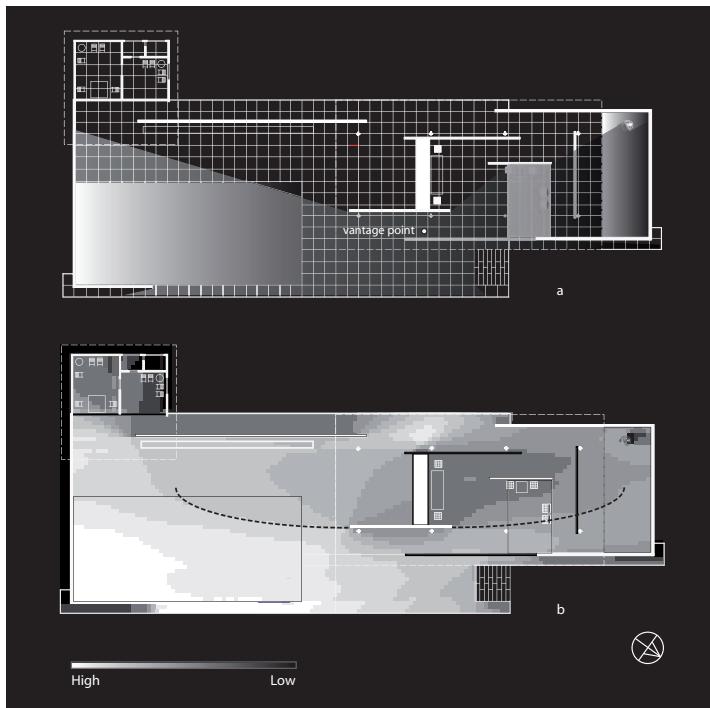
But apart from the architectural language, it seems to have paved the way for a different kind of geometric control in his designs. First, it challenged the classical tradition of overall symmetry, through local symmetry that was hidden behind the corporeal asymmetries of the building. Second, it engaged with the geometry of sight through the diagonal alignments of the end points of partitions. Local symmetries were not an invention of Mies or even Le Corbusier, but of the classical romanticism of John Soane and Friedrich Schinkel. But the diagonal alignments are Mies' own. They are as much geometrical as visual, controlling the visual aspects of the viewer's experience.

Visibility

Mies placed emphasis on how a building looked from the viewpoint of the observer (Constant 1990: 47). Evidence of this is provided not only by his perspective drawings and sketches or the reflective materials he used to manipulate the viewer's perception but also by the diagonal alignments. His drawings are revealing in terms of how he envisioned individual spaces, but quite different methods are needed to examine the entire field of visual experience as a continuous and flowing condition. To account for global visual relationships experienced by a mobile observer a tool called an 'isovist' is used, a visual polygon from a vantage point describing the visual field of a viewer (Benedict 1979: 47–65) (see Figure 2.6a). An isovist is a single unit of visual information. To represent the properties of isovists produced from all spatial positions a grid of points is superimposed onto the plan at a chosen

2.6

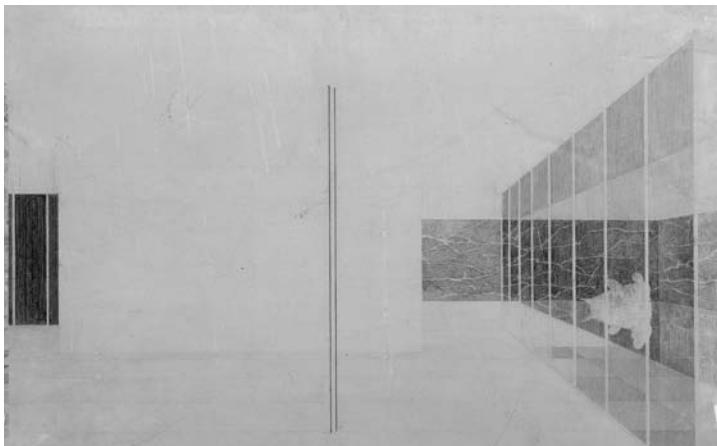
Barcelona Pavilion.
Visibility analysis.
(a) Isovists from a
vantage point.



(b) Diagram of visual integration based on visibility properties of a grid of locations. The distribution of grey tones captures the integration value of each unit of space i.e. how close a point is to every other point in the building.

level of resolution.¹⁷ A property that accounts for the structural relationship among visual fields is known as 'integration', describing visual interconnectivity of spatial locations. This measure looks at how many steps away every spatial point is from every other point in the plan, or how many times a viewer should change direction to see the entire layout. This measure is part of the analytical tools used by space syntax, a theory and a method for describing spatial characteristics and relating them to experiential, social and cultural factors (Hillier and Hanson 1984, Hillier 1996, Hanson 1998). Integrated areas are 'close' to all other spaces and can be accessed by few changes in direction, whereas segregated parts are experienced as more 'distant' locations. The analysis shown in Figure 2.6b used Depthmap (Turner 2006) and represents the distribution of integration through different shades of grey. Lighter tones indicate spatial areas that are 'closer' to all other locations and darker ones represent areas that are visually isolated. This diagram captures a number of properties of the building such as the lower levels of inter-visibility of the interior in comparison to the rest of the spaces.

The property of visual integration emerges from the geometry of sight, as each isovist is composed by lines that join each unit of space with all the vertexes of surfaces that are visible from this point. It is akin to the diagonal lines linking diametrically opposite end-point partitions and reveals a property that is difficult to discern with pure intuition: the distribution of shades in the visibility diagram follows a certain type of symmetry with respect to the translucent box, in that the contours of lighter shades on the left of the plan are almost symmetrical with the contours of



2.7
Ludwig Mies
van der Rohe,
Barcelona Pavilion,
(a) Pencil on tracing
paper.



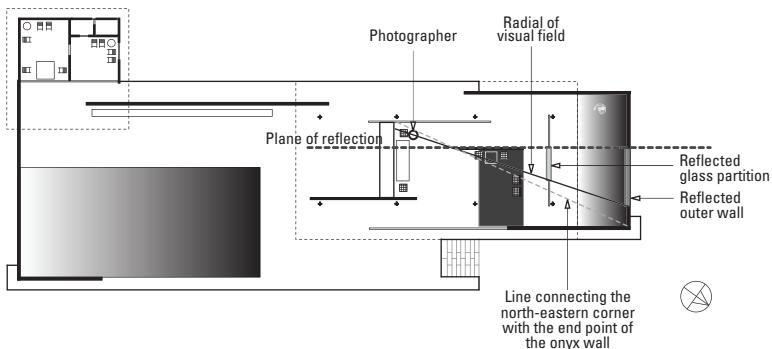
(b) 'Onyx Wall'.
The reflections on
the surface of the
onyx wall construct
the illusion of
a continuous
extension of
the partitions it
occludes through its
surface. The effect
is similar to that of
the interpenetrating
surfaces in the
work of Laszlo
Moholy-Nagy.

darker shades in the interior. So, the conceptual symmetry governing the placement of the translucent box coincides with approximate symmetry in the structure of visual information. However, Mies designed and drew in two and three dimensions, filling with his imagination the gap between drawings and three-dimensional experience. The visibility diagram in Figure 2.6b is a two-dimensional representation of visual relations among small units of space, something that he had not determined to create, nor had the tools to do so. Mies' tools were the diagonal lines fixing points in space. Why are they the way they are, and what impact do they make on the experience of the building?

Reflections

Mies explored his designs through drawings and sketches, often depicting a few surfaces with extraordinary degrees of detail. In a drawing of the Pavilion interior

(c) Reflections on the onyx wall mapped on plan. The circle annotates the position where the photograph in Figure 2.7b was taken from. The dotted line marks the line connecting the camera with the edge of the onyx wall. The solid grey lines on the glazed surface and the outer wall mark the reflection of these elements on the onyx partition. If the onyx wall had extended to the left of the diagonal line the reflected partitions would have not penetrated its entire surface. The diagonal lines are used to create the effect of perceptual oneness.



(d) Interior.

the onyx wall has a ghosted presence that contrasts the rendered textures of the other elements and the occlusion it causes to the back planes (see Figure 2.7a). An early photograph of the building also captures contradictory properties of the wall, but in a manner that resembles a glass partition (Figure 2.7b). The reflections of the elements it occludes on its surface have the effect of 'erasing' the property of occlusion, as though the wall was the outcome of photographic montage and in reality was not physically present.

Mies drew partitions seen through other partitions, removing 'weight' from these dividers and obliterating occlusion brought about by subdividing space. In his sketches for courtyard houses the walls bounding the courtyards at the background travel uninterruptedly behind glass surfaces. With the onyx wall and its replications in later houses, such as the Tugendhat house, he achieved a similar effect, but this time through opaque material (see Figure 2.8). With this wall he



2.8
Ludwig Mies
van der Rohe,
Tugendhat House.

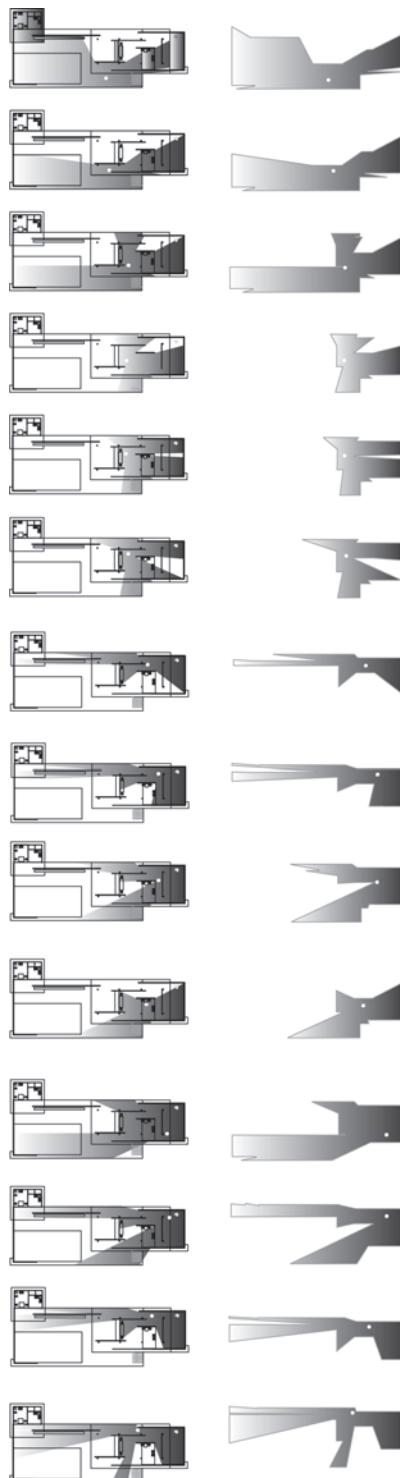
stretched the limits of 'erasing' optical obstruction to a point that the dividing plane was not installed to separate but to heighten a unified perception of space (Figure 2.7d).

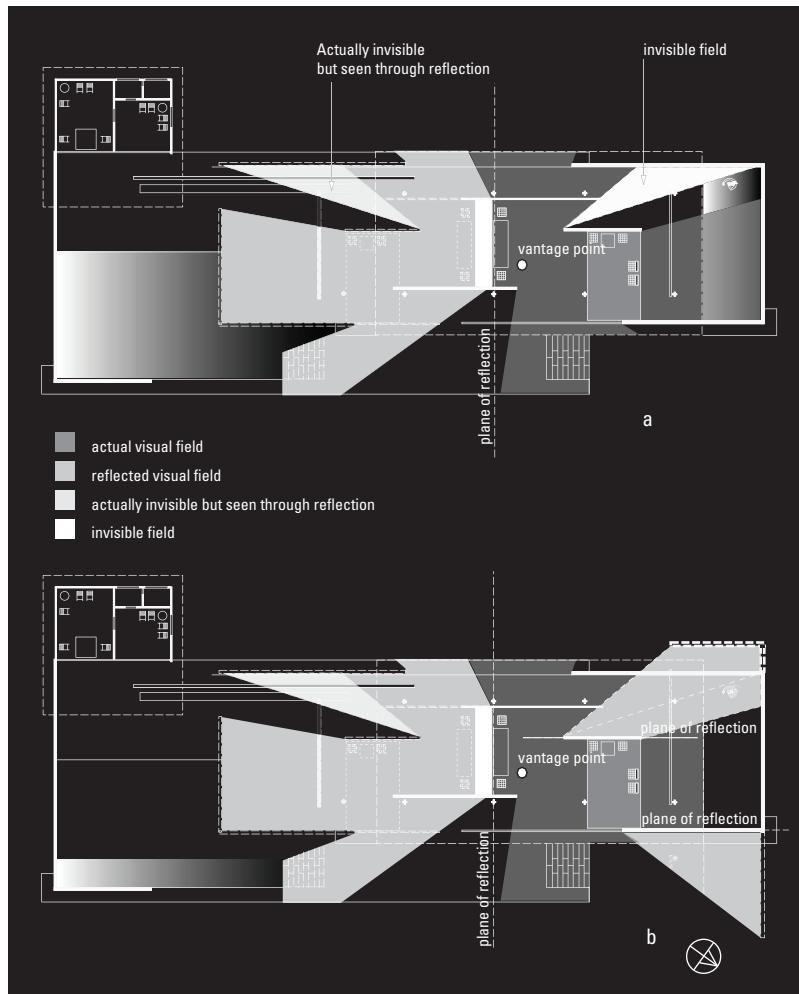
The changes to the dimensions of the Pavilion and the diagonal alignments were the essential mechanisms to arrive at this effect (Figure 2.7c). They were planned so as to establish the characteristics of the visual field necessary to see the reflection and perceive the interpenetration of the onyx wall and the other planes. If the diagonal line connecting the opposite corners was crossing the onyx wall the reflection of partitions would have not appeared to penetrate the entire width of its surface. But apart from controlling the effects caused by reflections, the diagonal axes demarcate triangular spatial areas on the plan, every point of which exposes the entire length of the external and internal partitions. Views from every spatial point in these areas reveal the same visible edges, corners and a great deal of every physical element. Depending on which triangular region on the plan a viewer occupies, three of four vertices are simultaneously visible (see Figure 2.9). Mies broke up the volume into individual planes, but he synchronized the visual limits of the building. In this way, he contrasted volumetric decomposition with the perception of the interior and the court as a unified space.

To understand how the reflective properties of other surfaces work, what is actually visible from selected positions and what is seen through a reflective material were mapped. Figure 2.10a and b show the actual visual field, the one reflected on the translucent box (Figure 2.10a) and the reflections produced on the outer surfaces (Figure 2.10b). The actual visual field comprises a large part of the patio and the interior. However, the translucent box reveals through a reflection a wider area, including a part of the space that is occluded by the onyx partition (marked on Figure 2.10a by a white triangle). Both effects, the interpenetration of

2.9

Isovists from selected points of the interior. The points are defined by the intersections of the diagonal lines in fig. 2.4 with the routes shown in fig. 2.2. Note that every visual field is demarcated at least by three spatial corners that define the interior of the pavilion and the inner courtyard.





2.10
 (a) Isovist and views through reflective surfaces. The white triangle is occluded in the actual visual field but made visible through the reflection on the luminous box.

(b) Reflected views on the translucent wall (left), the onyx wall (top right) and the outer wall (bottom right).

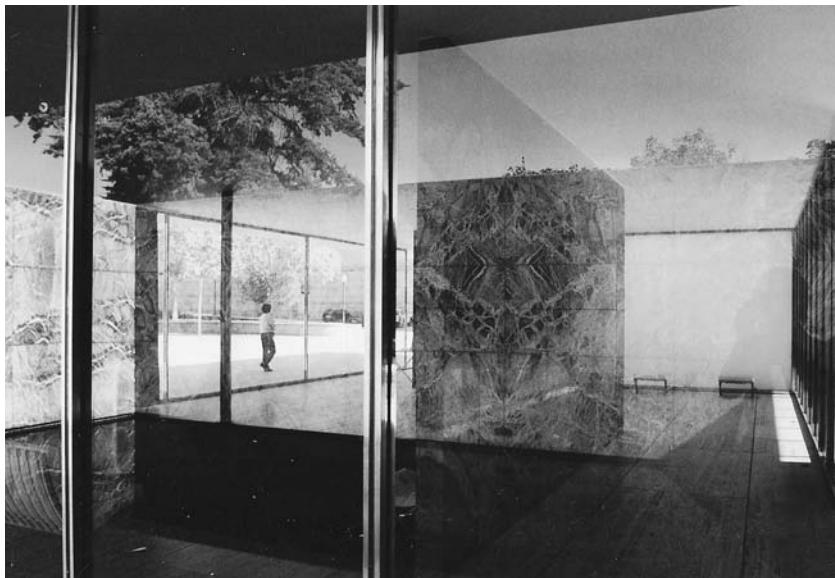
surfaces discussed previously and the exposure of areas that are hidden from vision, 'erase' occlusion, ensuring that the onyx wall has a minimum impact in terms of visual obstruction.¹⁸

But there is obviously an effect achieved by the reflective materials that is counteractive to the perception of space as a finite entity. Reflections on the peripheral surfaces and on the glass planes open up the physical limits of space implying spatial extension (Figure 2.10b). The reflections of the sky and the pool on the glass surface next to the court, for example, 'transpose' these elements to the interior so that the pool 'coincides' with the carpet and the reflection of the sky 'cuts back' the roof plane (see Figure 2.11a, b). Apart from accentuating the idea of decomposition, these reflections assert the multiplicity of planar symmetries and the participation of the natural elements in what constitutes the experience of the building.

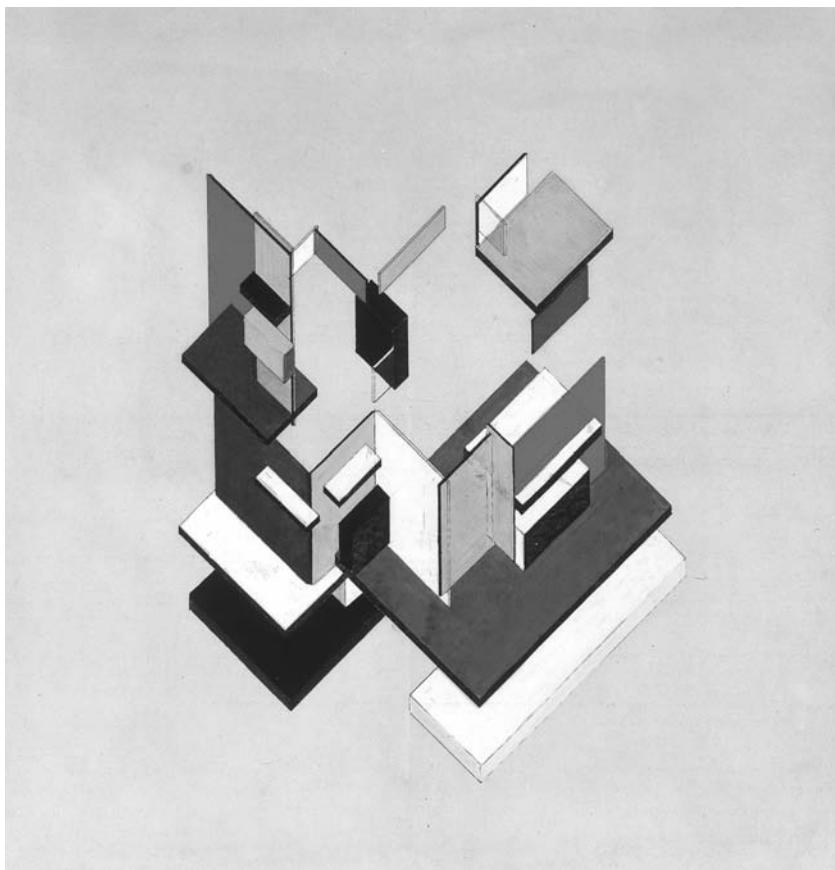
Simultaneity, the notion of infinite space and a free disposition of

2.11

(a) Barcelona
Pavilion, view from
patio.



(b) Theo Van
Doesburg and
Cornelius van
Eastern, 'Contra-
Construction Project, 1923'.



horizontal and vertical planes were some of the visual and conceptual ideas of de Stijl. In *Cubism and Abstract Art* Alfred Barr noticed a similarity between Mies' plan for the Country Brick House and van Doesburg's painting *Russian Dance*.

The resemblance is obvious and by no means superficial. The broken, asymmetrical orthogonal character of the plan was a direct result of Doesburg's sojourn in Berlin in 1921 and 22 at which time he publicized not merely the paintings of de Stijl but the works of its architects as well (1936: 156).

But critics have also noted significant differences between de Stijl and the Pavilion: first, in terms of the primary colours of de Stijl as opposed to the natural colours of chrome, stone and marble in the building; second, in terms of van Doesburg's emphasis on an 'objective' point of view achieved by axonometric drawings over Mies' emphasis on perspective (Constant 2000: 47); and, finally, the cropping of lines to imply their extension outside the canvas as opposed to the physical demarcation of the outer corners in the Pavilion (Padovan 2002: 109, Quetglass 2001: 111).

Van Doesburg attempted to take the ideas of de Stijl from the surface of painting to three and four-dimensional space. Using a representation of the four-dimensional cube that requires viewing from several directions at once, he tried to express the dynamic notion of time in the static medium of the flat surface (Evans 1995: 341, 342). But apart from a few cases, such as Rietveld's Schroder House,¹⁹ and Kiesler's *Space Construction*,²⁰ the style had a limited development in architecture. It is compelling to read the reflections and optical illusions in Figure 2.11a as a three-dimensional translation of de Stijl's ideas of infinite space expressed in van Doesburg's and van Doesburg's *Contra-Construction Project* (Figure 2.11b). But Mies denied any relationship between the Pavilion and de Stijl, removing not only material weight from surfaces but also the weight of language from architecture.²¹ Perhaps, this is because the expression of infinity is inseparable from the expression of finite space, or because the perceptual discoveries he made through this work had sharpened for him the difference between the two-dimensional explorations of de Stijl and those properties that can be observed only through the three-dimensional experience of a building.

Centrality and perception

Traditionally, centrality defined a privileged viewpoint, to occupy with the body and achieve a stable total impression, a whole that could be grasped by occupying a central position. In contrast, being 'modern', among other things, meant to 'affirm the free movement of the subject, the opportunity for the unfolding of life, against the previous idea that building was a solid physical mass that contained and constrained the life of the subject' (Forty 2000: 268). Instead of co-ordinating vistas geometrically and conveying the logic of a building from a single location Modernism encouraged the subject to move and see the building from different vantage points.

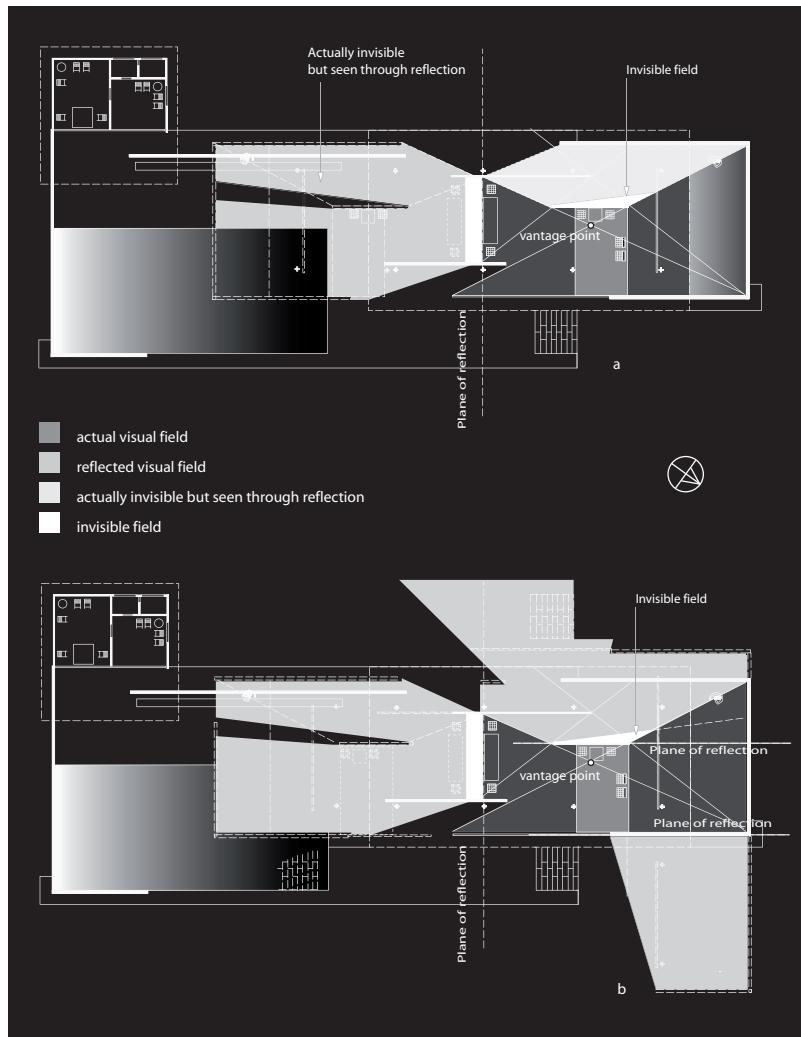
The modernism of the twentieth century attempted to solve this conflict

on a new level by liberating the classical building type from the polarity of inside and outside, from the enclosed interior space and the hierarchical elements. The revolt against the classical principles aimed at replacing them with new, antithetical ones. The Vitruvian concepts of a clear separation of inside and outside and of concentricity were replaced by centrifugality and a free interplay of contrasting elements, an equilibrium of tensions rather than harmony (Neumeyer 1991: xix).

Working within the spirit of Modernism, Mies affirmed the centrifugal composition and the movement of the observer whose body follows the meandering tracks of the building. But just as every verbal description of Modernism had to rely on its opposite – Classicism – to arrive at a precise definition, Mies relied on symmetry to sharpen his proposition. So, apart from emphasizing an experience based on movement he installed elements of static appreciation. First, through the diagonal alignments that synchronized the physical limits of space defining areas from which the spatial corners and the end-point partitions were constantly visible. Second, through the reflections on the onyx wall and the translucent box reflecting areas that are occluded and exposing what was hidden from vision; and, finally, through the two centralities of the onyx wall and the translucent box co-ordinating local geometrical properties in the building.

The diagonal alignments and the reflections are visual characteristics that enter perception. But the two geometrical centralities remain hidden inside the irregular appearance of the Pavilion. We saw that integration has almost a symmetrical distribution with respect to the wall (Figure 2.6b). However, this symmetry accounts for the structure of visual fields emerging from temporal experience. It does not manifest itself as a geometrical symmetry that is available to us through a correspondence between right and left like in a Palladian corporeal symmetry of a building.

But if it is impossible to grasp the role of the geometric centralities of the onyx wall and the translucent box, the mirror function of these elements, as Evans suggests, helps us find what is hidden (Evans 1997: 262). From the intersection of the diagonal lines at the front and the back of the onyx wall and from the area close to these intersections there is a view of the whole interior through the actual visual field and the reflections (see Figure 2.12a-d). Only a very small part of the plan indicated by a white triangle in Figures 2.12a-d remains invisible. This is the smallest area that stays hidden when one compares the isovists in Figure 2.12a-d with those produced from other locations (Figure 2.9). Staying close to the onyx wall enables the viewer to see the reflections on the translucent box restoring the effect of occlusion caused by the onyx partition. In contrast, moving towards the back right side of the Pavilion a large part of the translucent wall is visually blocked by the onyx wall and can restore only a small extent of the occluded field of vision. Moving towards the front of the plan also limits the restoring capacity of the translucent surface, as it becomes partially hidden by the black marble partition. From the front and the back of the wall, the wall and the box enter into a complementary relationship through which the viewer finds what is obstructed from vision.

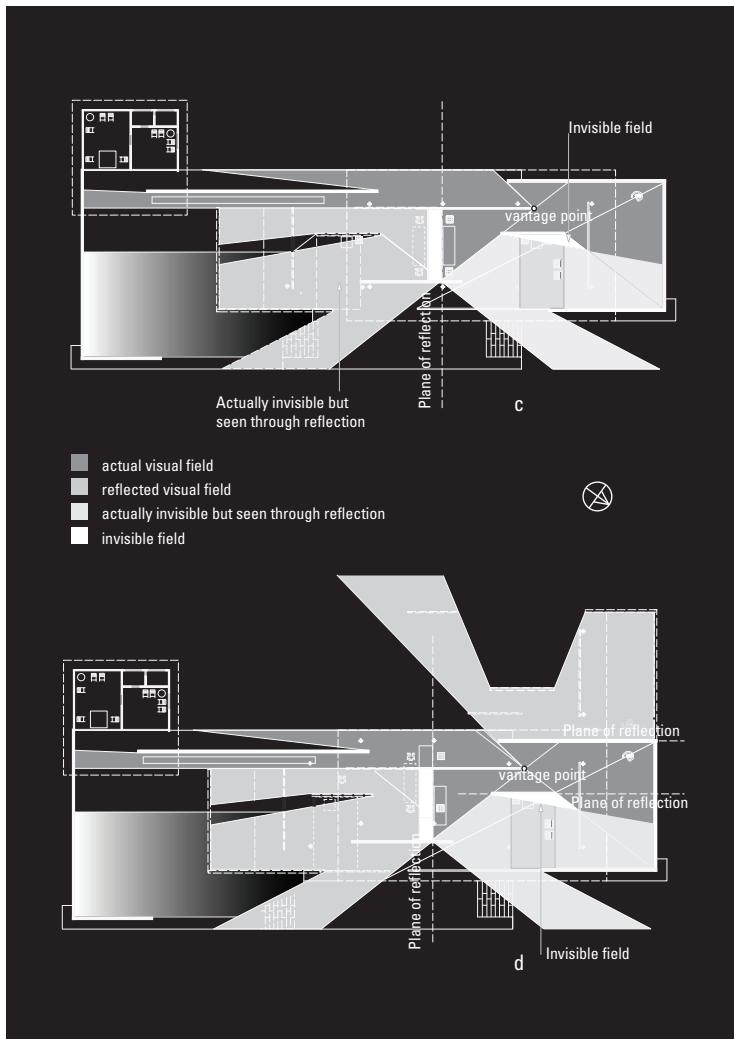


2.12
 (a, b) Isovists and reflected views from a standpoint located at the front of the onyx wall. The areas marked by the white triangles are the only parts of the interior which are invisible. The rest of the spaces are exposed either directly or through a reflection.

The external side of the translucent box has a role similar to that of the onyx wall 'restoring' the occlusion brought by its own surface. Standing close to the geometrical axis of the entire building and looking towards the Kolbe statue at the north-western side one sees on the translucent surface the reflection of the U-shaped element enclosing the large open area at the south-eastern area (see Figure 2.13). The part of the surface travelling behind the statue is also visible from this point. The two boundary walls are not equidistant from the translucent box, and so they appear unequal in height. However, the reflection 'completes' the occluded part, delineating the outer limits of the building.

It is not only symmetry that Mies restored through the reflective materials as Evans suggests. It is also a perception of space that has been subdivided by free-standing partitions, but can be seen in its entirety at a glance from certain

(c, d) Isovists and reflected views from a standpoint positioned at the back of the onyx wall. The standpoints in figures a, b and c, d are defined by the intersections of the diagonal lines shown in figure 2.4.



positions. By restoring occlusion the box and the wall assume a 'central' role in structuring experience. Their interaction defines a system towards which perception gravitates, where the changing views from different positions can be reassembled into a stable image.

Idea and image

By comparison, one has to make an effort to face the onyx wall. For me, this effort was prompted by the knowledge that it was indeed of central importance. Its reputation had preceded it (Evans 1997: 275).

Classical centrality is an idealized order. It co-ordinates views from different spatial



2.13
Barcelona Pavilion, view from exterior. The reflection of the bracketing wall on the luminous box 'reconstructs' the occluded part of the opposite bracketing wall behind Kolbe's statue.

points through geometrical similarity and renders them invariant with respect to a central position. By limiting experiential differences it subjects perceptual experience to geometrical sameness. This characteristic reinforces the central axis as the only factor of difference in a classical building. Reinforced by custom and cultural understanding the impact of sameness and difference on our perception is such that we do not need to move extensively to grasp a classical building. As Frankl suggests, it suffices to see it from few points to gain a complete architectural image (1968: 144). Our understanding of symmetry and centrality from few points precedes the kind of knowledge emerging from the actual process of experience.

Rowe pointed exactly to this gap between 'knowing' where the centre is by looking at the structural diagrams of Le Corbusier's Villa Stein, and not being able to detect a centre in the interior of the house. In contrast, from the cruciform hall of Malcontenta he has 'a clue to the whole building' (Rowe 1984: 12). This is not because he can stand at the centre and see everything at once, but because of knowing that this is the position from which he can 'receive a total impression'. Evans made a similar observation. His knowledge of the wall being the centre had preceded experience.

This is also what Mies meant by saying 'we know no forms. Only building problems. Form is not our goal, but the result of our work'.²² By rejecting form in favour of building he reacts not to the notion of geometry but to the idea that geometry is generic and form giving. The pursuit of form by Modernist architects in the 1920s was seen as private and subjective, a preoccupation with forms known from the past, 'an irresponsible sidetracking of the future' (Rowe 1984: 125). Mies opposed what he termed 'subjective license' with 'objectivity', a Platonic-Hegelian concept of eternal truth 'detached from all that is subjective and temporal' with a demand for the universal (Neumeyer 1991: 69). But objectivity implied also a classical idea bound to the abstracted and hierarchical forms of the past. The solution to the

paradox of a future entangled into Classicism was found by translating 'objectivity' to rationality, to mass production, fabrication and the 'impersonal purity of a technique' or the spirit of an epoch (Rowe 1984: 125).

Mies has been often associated with the rationality of construction. However, as Evans suggests, most of his buildings 'suppress all association with the stresses and strains of load-bearing structure' (1997: 247). Evans remarked that the Pavilion does not communicate its structural strategy, since the roof appears to rest on the walls and not on the pillars. Closely linked to the ambiguous tectonic expression of the building are the adjustments of the paving slabs made to 'look' similar rather than actually having similar dimensions. These characteristics indicate that Mies was concerned not with the expression of objective truth but with the *appearance* of rationality.

For Mies truth in architecture was not bound up in the clear and honest expression of materials, structure or function, but rather in the faithful correspondence of the image of the work with the intellect of the maker – that is, the relation of the image of construction to idea (Dodds 2005: 127).

I would suggest that truth for Mies is when the shape of the work emerges out of the viewer's effort to understand the intellect of the maker through the process of seeing. While our knowledge of a classical building is structured by projecting our understanding of centrality to the real world, the route to knowledge for Mies travels in both directions: between what our minds comprehend based on conceptual relations, and what our senses enable our minds to access based on our perceptions. So, the Pavilion does not have a single centre that will submit our perception to a priori knowledge. It has instead a number of centralities: local geometrical centrality, perceptual centrality based on the complementary relation between the wall and the box, and finally a multitude of virtual centralities based on reflections.

Conclusion

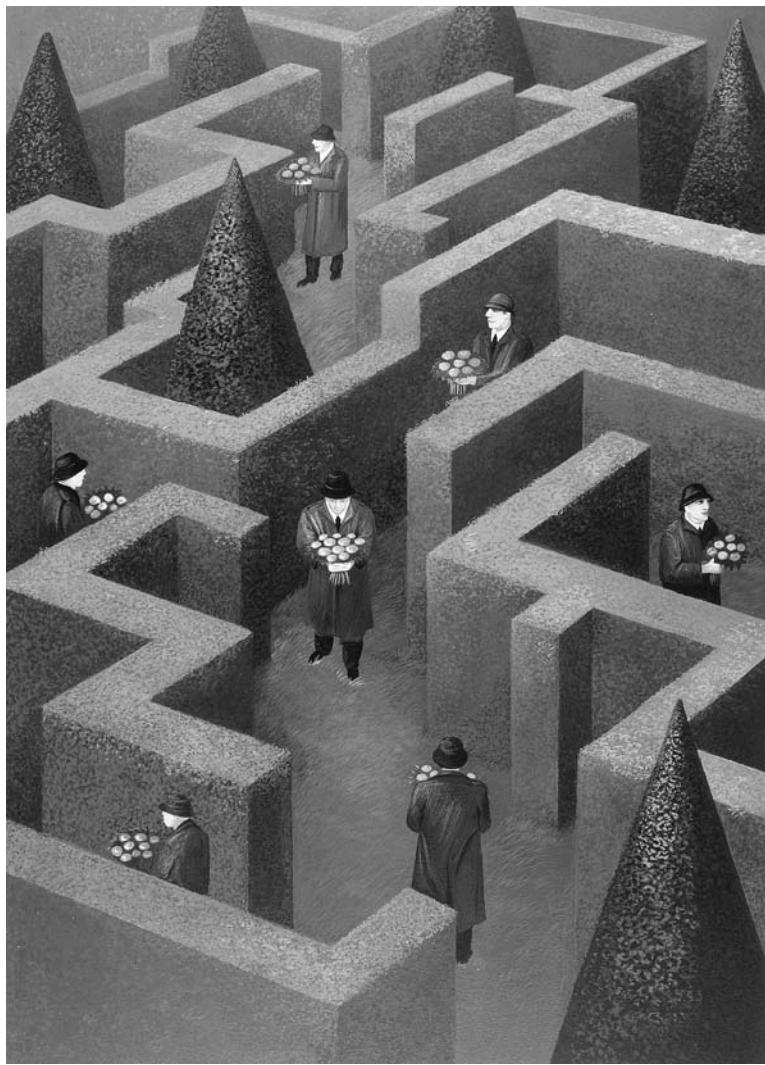
Van Doesburg and Mondrian avoided all aspects of appearance in striving for universality and abstraction. By eliminating contour, perspective and natural colour, they reduced space and the corporeality of things to 'a fragment of a boundless continuity' (Padovan 2002:31). But in the Pavilion Mies gave value to the creative tension between fragment and whole, idea and image, abstract and physical. On the one hand, he hid the geometrical axes behind the changing aspects of perceptual experience and saturated our senses with reflective materials. On the other, he 'erased' occlusion, making the changing and experiential parameters of reflections the very mechanisms through which we can retrieve the whole at once, moving without philosophical distinctions between the corporeality of things and their abstraction.

In response to the interpretations of the Pavilion as being antithetical to the static nature of classical forms, I explain that it can be also perceived at once anchored to a datum of visual stability. In contrast to the view that the Pavilion is an example of decomposition, I suggest it counteracts decomposition with a unified

enclosure. In relation to recent literature that the Pavilion has not a preordained geometrical order, it has been shown that its elements are geometrically aligned to control visual experience. The importance of these observations is not in contradicting previous interpretations but in attempting to enrich the ways in which we can understand this building by studying its properties. They point to a difference that Mies was well aware of: between trying to capture meaning through language and discovering it ineffably in the experience of buildings.

Part Two

Architecture and Narrative in
Literature



3.0
Labyrinth.

Chapter 3

‘The book and the labyrinth were one and the same’

Narrative and architecture in Borges’ fictions

If a straight line is the shortest distance between two fated and inevitable points, digressions will lengthen it; and if these digressions become so complex, so tangled and tortuous, so rapid as to hide their own tracks, who knows – perhaps death may not find us, perhaps time will lose its way, and perhaps we ourselves can remain concealed in our shifting hiding places.

– Carlo Levi, quoted by Calvino, I. (1996), *Six Memos for the Next Millennium*, London: Vintage, p. 47.

Introduction

When architects refer to design they cast it as a mental activity that is concerned with arranging forms, spaces, programme and materials. When they speak about a building they often describe it as narrative invoking a hypothetical viewer and a journey through space. Thus while design is portrayed as an activity of the mind, a building is seen as something to be experienced. This experience follows a route and unfolds in time. For some architects spatial narrative is central not only to the way in which they describe buildings but also to way in which they design. From Le Corbusier’s notion of ‘promenade architecturale’ to Daniel Libeskind’s Jewish Museum in Berlin, vistas are shortened or lengthened and routes are twisted or layered to achieve spatial drama and heighten suspense.

While architects are fascinated by narrative, writers are fascinated by architecture. From Dedalus’ labyrinth to Edgar Allan Poe’s gothic places, and Calvino’s *Invisible Cities*, architecture has fed the popular imagination with an infinite list of haunted houses and cobblestone passages. But it is not only popular culture that

architecture has supplied with spaces. Over the centuries it has served as the intellectual edifice where channels of thought in mathematics, cosmology, music, painting and literature intersect and poetically unite. In the *Art of Memory* Frances Yates described how in antiquity architecture became a model of memory through architectural types that served as mnemonic devices. For the orator, recollection was possible through associations between moments in a narrative and a sequence through spaces in a building (2001: 22).¹

But whereas architecture has aided mnemonic orientation, it has also served as a model for losing one's bearings through a plot. In his fiction Jorge Luis Borges uses chaotic spaces composed of hexagonal rooms, bifurcating paths and symmetrical houses in his speculations about knowledge and culture. Influenced by Borges, writers like Italo Calvino and Umberto Eco use the labyrinth, the castle and the city as settings and as themes for their narratives. In *The Name of the Rose* Eco constructs a labyrinthine library consisting of interconnected rooms in the image of Borges' *Library of Babel*. Borges' influence on Calvino is best explained by Calvino himself:

I will start with the major reason for my affinity with him, that is to say my recognising in Borges of an idea of literature as a world ... being formed in the image and the shape of the spaces of the intellect, and inhabited by a constellation of signs that obey a rigorous geometry (1999: 238).

The impact of architecture on the work of these writers extends to the role of reading and writing in ordering experience. In *Six Walks in the Fictional Woods* Eco uses the analogy of reading with walking, suggesting that a story is an unfolding world that is experienced in sequence, piece by piece (1994b: 6).²

Narrative, either based on successive actions in a story or on spaces that are seen sequentially, is at the centre of creative imagination. There are creations, in which fictional and spatial narratives are inseparable from each other – one cannot think of Joyce's *Ulysses* without thinking of Dublin, and we cannot think of Hoare's Stourhead Garden or Terragni's Danteum (Kanecar 2001) without thinking of Virgil and Dante. We might also say that there are no better examples to demonstrate that the relationship between architecture and literature is other than a new subject.

However, no matter how much is known, how much has been already said, and, most interestingly, how significant a study of literature and architecture is, Borges' fiction invites re-reading and therefore analysis, in the same way in which some buildings invite revisiting and subsequently scrutiny. Reading Borges, the architect can hardly fail to notice the feeling of being lost into the labyrinths of his plots, puzzled by the conceptual symmetries that link characters and events as well as by the architectural symmetries in the places inhabited by his characters. Seeing the growing attention that Calvino is receiving, the critic can hardly resist going to the source of Calvino's inspiration, and attempt to analyze the work of Borges.

The questions that this chapter addresses are: What is the role of architecture in Borges' fictions? Can a study of his work illuminate our understanding of architecture, or, more generally, how can one form of structuring experience

contribute to another one? If literary thought can be represented through architectural models, can architectural thought find expression through the ordering mechanisms of literature? The answers to these questions will be explored through the study of three stories: *The Theme of the Traitor and the Hero*, *The Garden of Forking Paths* and *Death and the Compass*.

Among poems, translations, essays and reviews Borges wrote examples of short fiction that strikingly encompass other books. The three stories examined here, which appeared between the early 1930s and mid-1940s, borrow from detective fiction. Although they differ, they are based on recurring themes, such as blurring the distinction between the fictional and the real, between linear and cyclical time, between presence and omnipresence. In the examination that follows these themes will be eventually discussed. However, the mode is descriptive before it becomes interpretative. The study of the connection between Borges' narratives and architecture should start from the way in which they are conceptually constructed.

This connection, I argue, is achieved in three ways: first, by using architecture as a metaphor for navigating through the linear progression of his plots; second, by deploying a depiction of space that combines eye-level experience with panoramic description to express this relationship; third, by alluding to philosophical ideas associated with the architectural contexts in his stories. Finally, by applying a narrative structure based on symmetry that enables us to grasp the narrative elements simultaneously beyond their positions in the linear sequence of the text. The chapter is structured in three parts: the first part focuses on the narrative structure of the fictions. The second part looks at how architecture is portrayed in the stories and at the role of spatial models in the philosophical content of the narratives. The third part discusses the ways in which architecture encompasses a narrative dimension.

Narrative structure

*The Theme of the Traitor and the Hero*³

Borges opens *The Theme of the Traitor and the Hero* at the moment of its inception, declaring his plan for a story and deciding on the time and location in which it takes place. He then introduces the narrator, Ryan, the great-grandson of Fergus Kilpatrick, an Irish revolutionary who died mysteriously in a theatre in the midst of a victorious rebellion. Writing a biography for the hero, Ryan attempts to explain the enigma of his death. He thus discovers parallels that link the murder of his ancestor with that of *Julius Caesar*. A warning letter sent to Kilpatrick echoes a warning letter received by Caesar. Also, a burning tower in Kilgarvan mirrors a falling tower in a dream of Caesar's wife. Ryan's first interpretation concerns the workings of cyclical time. However, new evidence drives him away from this hypothesis: words spoken by a beggar the night of the murder were 'prefigured' by Shakespeare in *Macbeth*. Amazed by history copying history and history copying literature, Ryan eventually deciphers the enigma: Nolan, the oldest comrade of Kilpatrick, had 'choreographed' the murder. Following Kilpatrick's orders to find a traitor, whose name had been scratched out from a document signed by Kilpatrick, Nolan discovered that the traitor

was Kilpatrick himself. Condemned to death by his comrades, Kilpatrick proposed to die heroically in order to save the rebellion and his reputation as a hero. Nolan, who was also a translator of *Julius Caesar* and writer of large theatrical performances, plagiarized events and words from Shakespeare to stage the scene of the assassination. Kilpatrick died in heroic ecstasy, in a rebellion that was also a public performance, and among hundreds of actors. Coming to the end of a long chain of prefigured events, Ryan realizes that Nolan's plot was planned so as to include the future discovery of the truth and that he perhaps, the writer of Kilpatrick's story, was also part of this plan. He decides to keep his findings quiet, aware of the fact that this might have been also foreseen.

It is apparent that behind a conventional patriotic fiction lies a complex structure of relationships and plot twists. Like most mystery stories, this fiction is composed as a diptych. The first part presents the enigma, while the second one provides the resolution. A change of roles marks the transition from the first to the second part, the most important of which is Kilpatrick's new identity as a traitor (from hero) and Nolan's new role as the main mechanism in Kilpatrick's assassination (from executor of his orders). Another reversal concerns Ryan, who is transformed from an author of Kilpatrick's biography and solver of an enigma to perhaps another instrument in Nolan's machine.

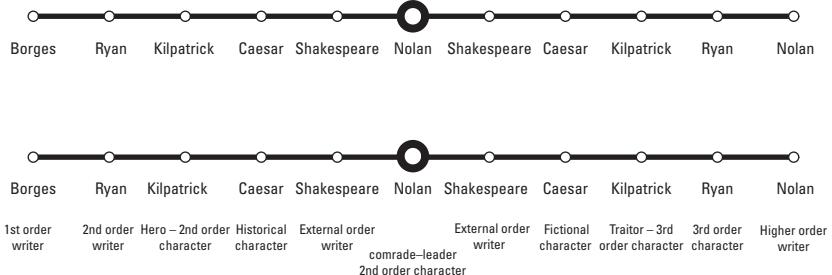
The geometric construction of the narrative

In order to study these transformations the story as represented by the main characters is mapped, according to the order in which they appear and reappear in the text. If the fiction is considered as a progression from beginning to end, there is a line that starts with Borges and finishes with Nolan (see Figure 3.1). Borges marks the first point on the line, making his presence as a narrator explicit at the start, while Nolan ends it with his new identity as the maker of the plot. The points between Borges and Nolan stand for Ryan, Kilpatrick, Caesar and Shakespeare. This representation leads to two observations: first, Nolan is also found at the centre of the line preceded by five points on the left and followed by five points on the right. Second, if we 'hinge' the line at its centre to form a diptych, all characters are mapped onto themselves, while Borges and Nolan (at the end) coincide with each other (see Figure 3.2).

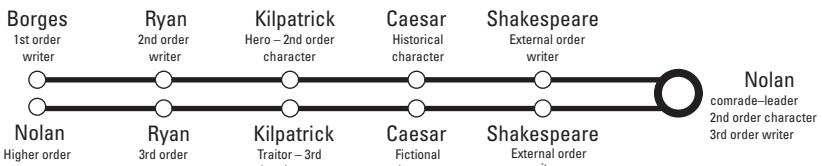
This transformation captures the dual identity of Kilpatrick (from hero to traitor); middle-Nolan (from comrade to leader) and Ryan (from author to character in Nolan's plot). It also suggests that Nolan is Borges, a proposition that stands firm since the fiction starts with Borges and ends with Nolan's appearance as a higher order author that includes also Ryan. As the end of a story brings us to the boundaries of the fictitious world Borges set clearly at the beginning, Nolan's reappearance as an author at this point suggests an identity that is external to the fictitious plane. Borges and end-Nolan are mirror versions of each other in the same way in which the biography written by Ryan is a mirror version of the story designed by middle-Nolan.

The idea of dual identities and the notion of a dual fiction make us aware of some further relationships. If Borges and Nolan are authors, and if Ryan and Kilpatrick are characters with a dual identity in the author's plot, how is the identity of Shakespeare and Caesar transformed from the first part of the diptych to the second?

3.1
Linear representation of Borges' fiction according to the order in which the characters appear in the text.



3.2
Borges' fiction line is hinged at the centre as in a diptych. The characters are all mapped into themselves. This transformation captures their dual identity in the story showing that Borges (1st order writer) and Nolan (higher order writer) are mirror versions of each other.

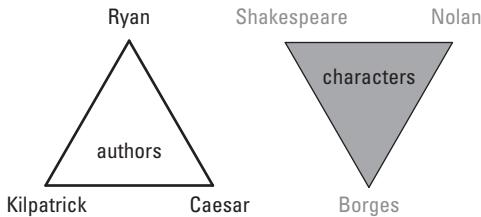


In part one Ryan discovers evidence surrounding Kilpatrick's death that is parallel to the death of Caesar, a historical character. Then he finds out about Nolan and his translations of Shakespeare's plays. This discovery marks a passage from history to fiction, with Caesar featuring as a fictional character. It is this identity that Nolan, in plagiarizing Shakespeare, sees also in Caesar. Finally, both Ryan and Nolan see Shakespeare as a writer, the former solving the enigma, the latter launching his own story, the 'choreography' of Kilpatrick's death. So, Shakespeare is the only character whose identity stays invariant: author of *Julius Caesar*, a story of an external order.

The suggestions that Borges and Nolan are symmetrical authors of a higher order and that Shakespeare is an author of an external order imply the following: Borges, Nolan and Shakespeare belong to a class of authors, whereas Ryan, Kilpatrick and Caesar are characters in the authors' plot. Since each member has a similar identity to all other members in the same group, we can represent each class by an equilateral triangle (see Figure 3.3a). However, 'authors' and 'characters' have dual identities also. Ryan is a writer of Kilpatrick's story and potential character in Nolan's plan. Nolan is Kilpatrick's comrade and writer of theatrical performances. Finally, Kilpatrick's improvisations during the rebellion establish him as an emerging author, while he had appeared to be only a character.

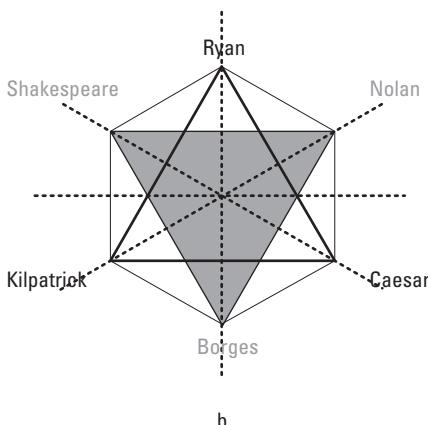
The condemned man entered Dublin, argued, worked, prayed, reprehended, spoke words of pathos. ... Kilpatrick, moved almost to ecstasy by the scrupulously plotted fate that would redeem him and end his days, more than once enriched his judge's text with impoverished words and acts (Borges 2000a: 109).

If we superimpose the two triangles we have the hexagon shown in Figure 3.3b. This shape has four reflectional symmetries and six rotational symmetries. Group theory defines symmetry as a transformation that leaves a shape invariant. If the hexagon is reflected on its four axes or rotated six times by 60 degrees, all vertices



3.3
Two triangles superimposed on each other forming a hexagon. Authors and characters become symmetrical.

a



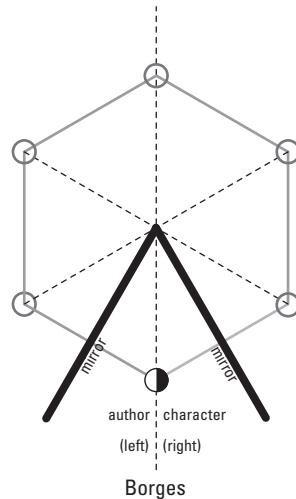
b

are mapped on each other and are, therefore, interchangeable. This representation leads to the conclusion that there is only one class or otherwise every person is a phenotypical variation of the same genotype, the universal category of 'story maker' who bears the dual identity of author and character.

If all members are reduced to this genotype, can we reconstruct the story from its generator? In other words, if we erase all names from the diptych, in the same way in which the traitor's name was scratched out from his death sentence, can we construct them again? This reconstruction is possible by two axes meeting at an angle of 60 degrees and a point that stands on the divider between the two axes (see Figure 3.4). This point is reflected three times and rotated twice. These transformations create the hexagon as in a kaleidoscope (see Figure 3.5). As all points are variations of the same genotype the two axes and the point can be seen as Borges looking at himself in two mirrors. If we think of the book we opened to read, *The Theme of the Traitor and the Hero*, and of the fiction-diptych as made by two mirrors, at the moment of the reconstruction, or at the moment of the second reading, we realize that we coincide with Borges and that authors and characters in the story are reflections of ourselves. What the author has not said but has indicated is that like Ryan we are captured in the plot. If author and reader coincide, the act of reading

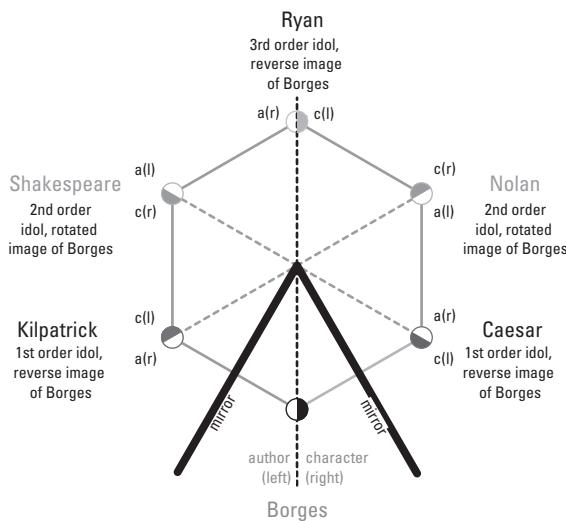
3.4

Reader and writer in front of the mirror – fiction. The point between the two mirrors represents Borges as a generic narrative unit that carries the dual role of author (in white) and character (in black).



3.5

Reflections and rotations capturing identities. The first and third order idols (Kilpatrick, Caesar and Ryan) interchange left and right through a reflection. The second order idols (Shakespeare, Nolan) are rotations of the initial image so that the author part of their identity is found at the initial position, i.e. on the left of the circle. The initial entity and its rotations capture the identity of Borges. The rest of the idols capture the identity of the character as a reverse image of the author.



and perceiving is also an act of constructing. To cite Eco, author and reader discover each other in the process of writing and in the process of reading (1994: 25).⁴

*The Garden of Forking Paths*⁵

The Garden of Forking Paths is narrated by Yu Tsun, a Chinese professor of English and spy in the secret service of Germany. About to be arrested by Madden, 'an Irishman at the orders of the English', Yu Tsun conceives a plan to transmit the secret name of the location of the new British artillery park to his German leader. He then visits Stephen Albert, an eminent Sinologist. The two men discuss a labyrinthine garden and a labyrinthine book called the *Garden of Forking Paths*, the works of Yu Tsun's ancestor, Ts'ui Pen, who was murdered by a foreigner. Ts'ui Pen, governor

of Yunan province, astronomer, astrologist, chess player, poet and calligrapher, had devoted 13 years to constructing a chaotic novel and a labyrinth 'in which all men would lose their way'. Albert explains the mystery surrounding both works, demonstrating that 'the book and the labyrinth were one and the same'. Instead of a physical labyrinth that forks in space, Ts'ui Pen had constructed a fictional maze that bifurcated in time, allowing several choices for action, and several futures. The idea of multiple futures co-existing in time convinces the protagonist to kill Albert, certain that in other universes he and the Sinologist are not enemies but friends. Arrested by Madden, Yu Tsun completes his mission to report the name of the city called Albert to his German superior. The latter eventually deciphers Stephen Albert's murder, which appeared to be an insolvable enigma for the British press. However, a reference to Liddell Hart's *History of the World War* in the opening paragraph informs us that Yu Tsun's mission caused only a minor delay to the British attack.

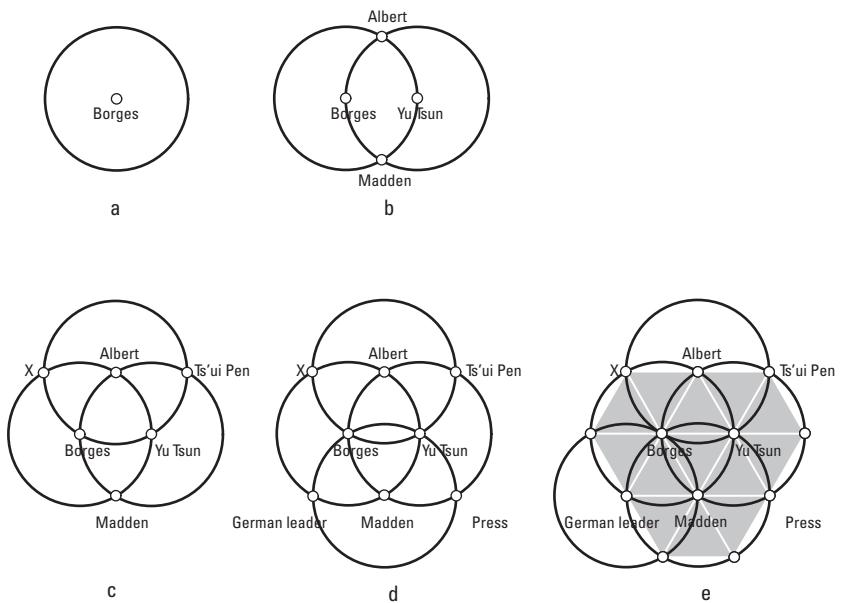
As in the previous fiction, a narrative strategy is applied here in the form of stories and characters that are mirror images of each other. Borges, writer of *The Garden of Forking Paths*, is symmetrical to Ts'ui Pen, writer of the *Garden of Forking Paths*' second order story. Albert is also symmetrical to Ts'ui Pen deciphering his labyrinth and dying by the hand of a foreigner. Yu Chun is linked with Madden, both being at the orders of a country foreign to their own. They are also symmetrical with the stranger who killed Ts'ui Pen by virtue of being either persecutors or murderers. In the previous story reflections and rotations led to a single generic identity. This time murderers become victims and vice versa through the theme of infinite bifurcation. To generate a geometrical pattern that captures infinity it is necessary to construct the basic units of the fiction and study the ways in which they expand to other units and stories.

The geometric construction of the narrative

We can represent Borges' *Garden of Forking Paths* by a circle with Borges at the centre (see Figure 3.6a–e). Yu Tsun's narrative generates another circle, the centre of which is situated at the circumference of the first one (since Yu Tsun features in Borges' fiction). The two shapes intersect on two other points, taken by Albert and Madden (Figure 3.6b). A third story is Albert's interpretation of Ts'ui Pen's book. Another circle is formed with Albert in the centre intersecting the previous two circles on points occupied by Ts'ui Pen and the unknown murderer and resulting in new circles (Figure 3.6c, d). Madden arresting Yu Tsun releases a story to the press, which leads to a seventh circle. The German leader, who lies at the centre of an eighth circle, eventually deciphers this story (Figure 3.6e). This pattern can grow infinitely, creating a network of triangles and nodes that branch out in all directions, expressing the pattern of bifurcating paths (Figure 3.7). All nodes are symmetrical with each other based on 'translations', a term that describes a transformation resulting from shifting the position of an element on a plane. The circles were constructed by moving their centres along three axes. In the previous story the geometrical structure is the hexagon, while the metaphor to reconstruct this shape is the hinged mirror. In this story the geometrical pattern is the triangular tessellation, whereas the metaphor is the tiled surface.

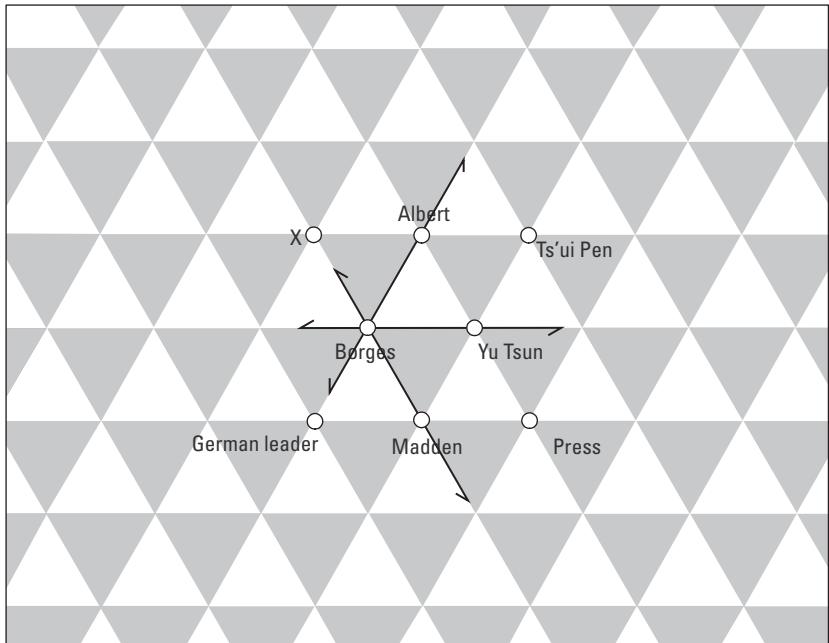
3.6

Representation of the fiction using intersecting circles. The centre of each circle represents a narrator, whereas the perimeter stands for one of the stories embedded in the fiction. A regular and expanding pattern of intersecting circles is generated that captures the geometrical structure of the narrative and the infinite expansion of stories.



3.7

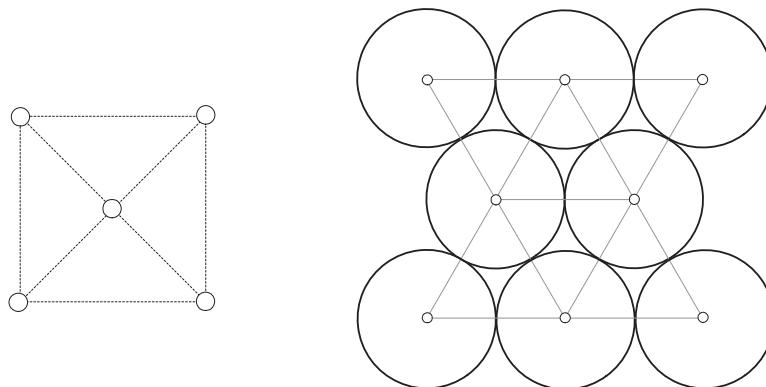
Representation of the fiction as tiled surface.



Sir Thomas Browne, a seventeenth-century English philosopher, wrote an essay entitled *The Garden of Cyrus* (Huntley 1966), suggesting that the pattern of ancient plantations was the quincunx, which captured the mystical mathematics of the city of heaven (see Figure 3.8). In the opening chapter he proposed that the original pattern was not the square but the lozenge generating a triangular grid. This configuration allows closely packed circles to be formed, providing the densest planting of trees in an orchard (Moore, Mitchell and Turnbull 1988: 161). For Browne this was also the original pattern of chessboards that brings us to Albert's question to Yu Tsun: 'in a riddle whose answer is chess, what is the only word that must not be used? ... The word "chess" I replied' (Borges 2000a: 85). Albert's question aimed at demonstrating that in Ts'ui Pen's book, an enigma whose answer was time rather than space, the word time was deliberately omitted. The association of the quincunx plantation as cosmic model of heaven, with the chessboard and the maze, expresses the relationship between the human mind and the world whose logic it deciphers in the form of the ordered patterns of geometry, mathematics and language (Irwin 1994: 140).

Irwin argues that Ts'ui Pen's labyrinthine book alludes not only to Browne but also to a garden that is both a labyrinth and a chessboard – the garden of Looking-glass House in Lewis Carroll's *Through the Looking Glass* (1994: 75). Carroll's book creates temporal reversals and spatial inversions. Gardner comments that Alice's dream of the red king who dreams of Alice suggests infinite regression like two mirrors facing each other (Gardner 2001: 198). For Gardner chess encompasses the notion of the mirror by the reflectional symmetry of the opposing chess pieces at the start of the game. The allusions to Carroll and Browne then seem to suggest that by reading *The Garden of Forking Paths* we are reading a riddle whose answer is chess.

Calvino in *Invisible Cities* has also used chess as a metaphor for the structural relationships underlying a narrative. For Peponis it refers to Saussure's comparison between language and the game (Peponis 1997a: 43). Each move on the chessboard is understood within the structural rules, in the same way in which words in a sentence are understood in terms of their relationship to other words. It can be added that the comparison with chess points also to another fundamental



3.8
The quincunx (left) and minimum spacing of circles (right).

proposition by Saussure. The mode of signification is governed not only by sequential operations (of noun and verb, subject and predicate etc.) apparent in a sentence, but by structural laws of association which relate each signifier to other potential, but not actually present, signifiers within the total system of language (Saussure 1983: 124). In Calvino's *Invisible Cities*, laid out as riddles, Kublai Khan tries to decipher their logic with the help of the chess game. The name that is not used but is always implied is: Borges.

In his essay *When Fiction lives in Fiction* Borges refers to Velasquez's painting *Las Meninas* showing Velasquez himself painting a portrait of Phillip IV and his consort who are outside the frame but reflected in a mirror (2000a: 160). On the painter's chest is the cross of Santiago (see Figure 3.9). Borges explains that there was a rumour that the King painted it there, making him a knight of that order. He concludes that inserting one painting inside another one corresponds in the world of literature to the interpolation of one fiction within another fiction. Velasquez's pictorial technique to omit the royal couple providing their reflected image instead corresponds to the absence of direct reference to Lewis Carroll. But it is not only Carroll who is implied in Borges' canvas. Looking at the painting we see the characters looking at ourselves. We realize that the pictorial plane expands to include us and that we perhaps are the missing subjects. Following the conventions of



3.9
Velasquez, *Las Meninas*.

Western pictorial representation that opens a window in the real world, *Las Meninas* challenges our habitual reading of paintings as representations of reality. By pulling us into the scene, it puzzles us with the paradox of real and fictional space merging into oneness. Borges' narrative techniques achieve the same effect. The multiplied personae of the author onto the tiled surface open a window into his mind. There we see what he wants us to see: seeing ourselves seeing.

***Death and the Compass*⁶**

Death and the Compass is the story of the attempts of detective Lönnrot to solve the mystery of a periodic series of murders. The first murder took place on the night of 3 December. The rabbi Marcelo Yarmolinsky was killed at a hotel that appears to be located in the north of a European capital city.⁷ Among his books was a treatise on the Tetragrammaton, the secret name of God, and in his typewriter a sheet of paper saying 'The first letter of the Name has been written'. The second victim, Daniel Simon Azevedo, was killed on the night of 3 January on the doorway of a paint factory. On the walls, across the painted diamond shapes, was the sentence: 'The second letter of the Name has been written'. The third murder occurred on the night of 3 February, during Carnival time. The victim, a man called Gryphius, was killed by two harlequin figures whose costumes bore coloured lozenges. Scrawled on the blackboards of the tavern where the murder took place was: 'The last letter of the Name has been written'. A letter and a map of the city sent to the police predicted that there would not be a fourth crime on 3 March because the locations of the three crimes in the north, west and east of the city formed an equilateral triangle. Lönnrot examines all evidence in the light of the Tetragrammaton, which has four letters rather than three. The diamond shapes featured in the last two crimes and the Jewish day, which begins at sundown, suggest that the murders were committed on the fourth day of each month. A drawing compass and a navigational compass reveal the location of the fourth murder – the abandoned villa Triste-le-Roy. Arriving at the villa he is astounded by its perfect symmetries. Exploring a series of repeated spaces, he progresses from the cellar to the top of the house where he is captured by the criminal Red Scharlach. Scharlach reveals the maze he had woven around Lönnrot. The first murder happened by mistake. He, Azevedo and friends of theirs had planned a robbery in the hotel where the first victim stayed. Azevedo double-crossed his associates, got lost in the hotel, went into the rabbi's room and killed him when he tried to call for help. Reading in the newspapers that Lönnrot was trying to find the solution to the murder in the rabbi's writings, Scharlach planned the other two murders to reinforce Lönnrot's belief that Hasidic Jews had killed Yarmolinsky in the quest of the secret name of God. The second victim, Azevedo, was killed because he 'acted on impulse and was a traitor'. The last murder was a simulacrum with Scharlach in the role of the third victim, Gryphius. Thinking for the last time the problem of the symmetrical periodic numbers, Lönnrot proposes a labyrinth that is more economical than the two-dimensional maze of Scharlach.

'When you hunt me down in another avatar of our lives, Scharlach, I suggest that you fake (or commit) one crime at A, a second crime at B,

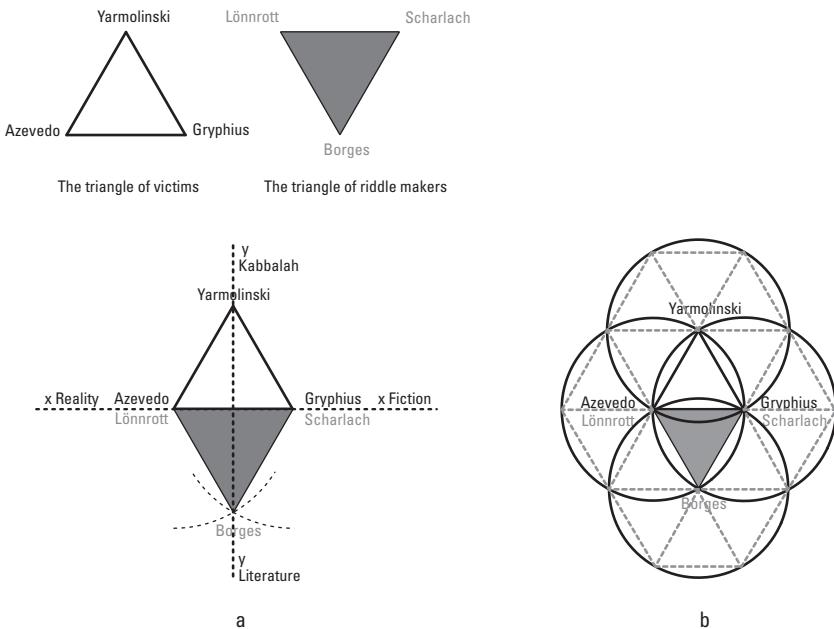
3.10

Representation of the fiction as a set of triangles and intersecting circles.

(a) The shape has two reflectional and two rotational symmetries. The y axis expresses a relationship between literature and the Kabbalah, while the x axis relates fiction to reality.

(b) The arcs that are used to define the fourth point are extended to form circles. These circles generate the triangular tessellations shown in figure 3.6 that extend the morphological pattern to infinity.

All points are interchangeable suggesting a single narrative unit carrying the dual characteristic of slain and slayer. In the story the triangular units are expressed through the window lozenges in the belvedere of Triste-le-Roy.

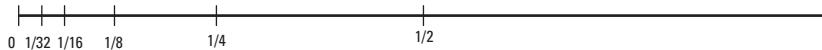


eight kilometres from A, then a third crime at C, four kilometres from A and B and halfway between them. Then wait for me at D, two kilometres from A and C, once again halfway between them. Kill me at D, as you are about to kill me at Triste-le-Roy' (Borges 2000a: 123).

Irwin suggests that Lönnrot and Scharlach are doubles of one another (Irwin 1994: 30). The end syllable of Lönnrot means red in German, and Red Scharlach is also translatable, in German, as Red Scarlet. However, there is more to their symmetry than the semantic similarity in their names. They are symmetrical by virtue of constructing and solving puzzles, which is common to all characters in the three stories. It is by this characteristic that slain and slayer, riddle-creator and interpreter hold a mirror on which we see Borges, higher order author of mazes, reflected.

In this fiction the shape of the crimes and their topography is not only the geometrical structure linking the characters (see Figure 3.10a, b), but also a device that lures the protagonist. Narrative turns upon its own structuring to reflect its mode of operation. In the story, Lönnrot's search for the solution to the problem in the writings of the rabbi is juxtaposed with the suggestion of the police commissioner that Yarmolinski's death happened by mistake. However, Lönnrot's interest in logical mathematical conjecture gains predominance over the legitimacy of accident and over the pragmatic facts in the murders. 'He had virtually solved the problem; the mere circumstances, the reality (names, arrests, faces, the paperwork of trial and imprisonment) held very little interest for him now' (Borges 2000a: 118).

Borges turns our attention to the geometrical structure as failing to capture a precise image of reality. If the models in his stories, or in Lönnrot's mind,



3.11
Division of a line into infinitely regressing fractions.

can link actions and happenings, real life does not necessarily fall into conceptual patterns. Realizing his defeat, Lönnrot proposes a linear mathematical labyrinth, where he and Scharlach will face each other in other fictions. This labyrinth is known as Zeno's paradox, and concerns the division of a distance between two points into regressing fractions (see Figure 3.11), (Aczel 2000: 12). While the fractions are infinite the whole is conceived as a single entity. If reality has random instances, Borges seems to suggest, if the beginning of the sequel was based on accident, the writer, the artist, the scientist and the philosopher will continue weaving webs in order to explain its apparent chaos and randomness. They will continue trying to reconcile two categories, unity and its divisibility into infinite parts, which reality is unable to synthesize.

Borges' narrative strategy

The comparative study of these fictions shows that the narrative strategy of Borges consists of a minimal narrative unit defined along the opposition of slain and slayer, which have a symmetrical relationship with each other. This unit is reflected several times, producing a number of identical units. In the linear progression of the narrative this structure is disassembled to achieve differentiation. The units are characters that appear under different identities. They are German spies or Sinologists, Chinese governors, police detectives, poets, chess players, or Irish revolutionaries. They are contemporaries or belong to different temporal moments. They make their appearance from other fictions or from historical events. Underneath this diversity of people, happenings and works of literature lies a network of geometrical relations establishing their homogenization across the plane.

As the characteristics that signify the identity of the narrative units in the stories, such as origin, preoccupations and predilections, revolve around recurring oppositions, they undergo specific transformations. Heroes become traitors and their comrades become their judges, persecutors become victims and pursued criminals weave mazes that capture their hunters, Irish conspirators become play writers, fictional characters become historical or literary figures, and readers become writers. These transformations carry higher levels of meaning, defined across contrasts between history and fiction, fiction and literature, time as transition from one event to another and time as timeless present. They mediate the relationship between writing and reading, between raising questions and finding solutions, between observing the phenomena of the real world and organizing them into meaningful and ordered propositions.

Claude Levi-Strauss provides an illustration of mythic and ritual structures of societies based on their logical structure. The constituent units of myth cannot be explained in isolation from each other. Such a reading looks at their literal-semantic content, which quite evidently lacks any sustained or universal significance. Meaning resides in how these elements are combined (1963: 210). The structural relations within a comparative mythology show that the task of myth is to reconcile oppositions

that remain insoluble at the empirical level of experience (Kearney 1986: 259). The comparative analysis of the narratives shows that the task of Borges has been to provide a creative synthesis of fundamental notions, like unity and infinity, similarity and difference, nature and culture, self and other, time and eternity, as if they are one and the same, whereas in reality are often seen as separate and distinct.

From Borges' fiction to architecture

At this point we come to examine the role of architecture in these fictions. At the pure pragmatic level, architecture in a story is used to render the idea of space where action takes place. In the first fiction Dublin is the urban stage for Kilpatrick's assassination. Although there is no physical depiction, the cityscape is implied through Kilpatrick's actions and the actions of 'hundreds of actors' who took part in the rebellion. The second story follows Yu Tsun from his flat to the country road that brings him to Stephen Albert's house. Among all places the English countryside gains special importance. Walking in this landscape, pictured by forking country roads, dew-drenched paths and formless meadows, Yu Tsun navigates, turning left at every crossing. He is thus reminded of a way to discover the centre in a maze, and of the labyrinthine garden of Ts'ui Pen. In *Death and the Compass* architecture enters the narrative through a map with a superimposed diamond shape and through the places of the four murders. However, as the narrative advances to its end, it focuses on the villa Triste-le-Roy, describing Lönnrot's path from the garden to the belvedere through the symmetrical house and its identical rooms.

The choice of setting establishes a geographical, topographical, historical and social context. However, architecture in these fictions carries meaning beyond the realistic representation of place. Dublin in the first story becomes the stage for a theatrical performance, the scenes of which have been taken from *Macbeth* and *Julius Caesar*. It echoes Joyce's *Ulysses* in which every episode corresponds to an episode in the *Odyssey* of Homer.⁸ Stephen Dedalus, one of *Ulysses'* heroes, is named after the mythological inventor of human flight and creator of a labyrinth. Burgess explains that Joyce conceived the sixth chapter of *Ulysses* spatially and wrote it with a map of Dublin and a stopwatch. Confusions in the chapter, created by the unexpected insertion of characters involved in the plot, generate the feeling of being lost in a maze (Burgess 1982: 134).⁹ Borges' choice of Dublin, thus, alludes to another work of literature and to the city as labyrinth.

The English landscape in the *Garden of Forking Paths* is the landscape that inspired William Kent, Humphrey Repton and Capability Brown. Its essence in the eighteenth century was to eliminate the accidental flaws of nature and 'improve' its patterns to match an existing conception of beauty. Walking on the country road, Yu Tsun thinks of the garden of his ancestor. Like many English gardens, the gardens of China are miniatures of natural worlds, combining 'seas', 'lakes', 'mountains' and 'habitable islands', all apparently informal but composed in a precise and contrived way. There are no straight lines, no symmetrical elements, allowing for layers of discovery within a flowing nature.¹⁰ The choice of the English and the Chinese garden evokes the relationship between the apparent informality of nature and the human intervention that simulates and reinforces its patterns.

In Yu Tsun's imagination the garden of Ts'ui Pen expands to include 'rivers, provinces and kingdoms' and eventually an infinite universe where every scene dissolves to a mental landscape of contemplation. The depiction of space thus shifts from a station point positioned at eye level to one that is placed at a remote distance. Certain pictures and woodcuts of early Chinese gardens, such as the garden Yuan Ming Yuan, depict aerial views of buildings, mountains and lakes in a way that is different to the Western post-Renaissance paintings where the artist and the observer are placed in the composition. For Gibson they lack a fixed point of observation. Examining Japanese depictions that are similar to that of Yuan Ming Yuan, Hagen explains that they do have a fixed viewpoint, but it is set at optical infinity (1986: 145). The depiction that changes with Yu Tsun's position in space and the one that is panoramic alludes to the relationship between the unfolding sequence of the fictional events and the narrative structure, which is static, sees everything at once and organizes them into ordered patterns.

Evans argues that ideas about perception are dominated by vision and are defined by pictures and projections (1995: 357). The ideas about landscape design in the eighteenth century were also influenced by pictures, like the idealized Roman landscapes of mythical scenes painted by Claude le Lorrain and Nicolas Poussin (see Figure 3.12).¹¹ Chinese landscape gardening was also rooted in landscape painting with the painters themselves participating in the construction of gardens (Cho Wang 1998: vi). Parallel to painting, there was an influence from poetry and literature. This found expression in the form of verses that were incorporated into the garden elements or of narratives episodes that were visited in sequence. Examples of such gardens are the Ge Yuan in Yanszhou and the Stourhead Garden in Wiltshire. It is not clear whether Borges saw the story scenes in this way aided by existing landscapes and by pictorial examples. However, *The Garden of Forking Paths* is informed by



3.12
Claude le Lorrain,
Landscape with
Aeneas at Delos.

significant moments in the history of ideas of landscape design and its pictorial representation. These ideas were based on philosophical approaches that saw the garden as an integral part of nature and of an underlying universal order. It is here that the origin of a labyrinth that consists of a book that contains the universe of all possibilities is founded. Borges uses specific cultural contexts and the philosophical framework that found expression in landscape painting, landscape design and their creative incorporation of literature to enrich the story's content.

The places upon which Lönnrot sets foot in *Death and the Compass* are the cityscapes of a European capital. They are informal places of diversity, with factories, museums of wonders, brothels, tanneries, bookshops, Irish taverns and echoing suburbs. Researchers of the city suggest that cities possess an underlying logic in the form of spatial connections that is manifested in the ways in which people navigate through their streets (Hillier 1996: 161). However, their map does not have a geometrical structure of parts that can enable us to understand them as wholes. Against this cityscape of informality two readers, Scharlach and Lönnrot, face and measure each other with the help of a compass. Victory belongs to the one that better grasps the complexity of the two layers: the city seen from the ground, echoing the narrative progression with its sequence of murders, and the superimposed shape, expressing the underlying order of symmetries, the surface of geometric tessellations.

Leaving the city's 'labyrinth' Lönnrot comes to the solitude of the villa Triste-le-Roy. This is the moment that narrative through fiction and narrative through space coincide, following his steps through identical courtyards and chambers with facing mirrored walls. The house is a palace of disorientation and infinite reflections. Understanding the 'architect's predilections' Lönnrot concludes that it looks infinite because of its symmetry, its mirrors and his lack of familiarity with the place. So, he manages to navigate from its depths to the belvedere. His route marks the transformation from ignorance to the time he meets his plotted death. The villa whose name in French means 'the sad king' is the place where the game ends at checkmate. Lönnrot's last experience evokes the superimposition of the diamond shape on the city's grain.

A stair took him to the belvedere. The moonlight of the evening shone through the lozenges of the windows [120] ... Lönnrot avoided Scharlach's eyes. He looked at the trees and the sky subdivided into murky red, green and yellow rhombuses (Borges 2000: 123).

Triste-le-Roy with its symmetrical disposition of rooms, staircases and statues is modelled like a classical villa which, starting from Italy in the fifteenth century, reached France and northern Europe. Following a tradition rooted in the Pythagorean and Platonic conception of mathematical order and supported by a medieval conception of heavenly proportions and numbers, the Renaissance architects applied harmonic ratios and symmetries to the layout of villas and gardens (see Figure 3.13). Influenced by Roman ideals for rural life through Virgil and Pliny, they combined Vitruvius' idea that architecture must mirror the human body, the pagan conception of mathematics



3.13
Palladio, Villa
Malcontenta.

and beauty and the Christian conception for a divine cosmic order (Wittkower 1988: 25).¹² Triste-le-Roy is not just an edifice where Lönnrot wanders, loses his way and emerges from in search of a solution to the crimes. It embodies moments in the history of ideas about the universal edifice and the ways in which these were poetically synthesized in architecture.

Three kinds of landscapes are painted on Borges' canvas: an urban landscape, a perfected natural landscape and an interior landscape. All three are negotiated by the characters as they progress to the end of their actions. Kilpatrick, a condemned man, enters a cityscape as Stephen Dedalus and Leopold Bloom entered it, in the footsteps of other writers, through the labyrinths of Homer, Joyce and Shakespeare. Marching to his predetermined death he enhances this labyrinth with his actions and 'words of pathos'. Yu Tsun, a pursued man, advances in the English landscape in search of Stephen Albert whose name will send out a coded message to his German superior. Instead of a garden-labyrinth he finds a literary labyrinth that contains all characters and all actions. Lönnrot traverses the city from east to west and from north to south. He comes to a house in search of a symmetrical pattern that enabled him to read order out of the city's apparent chaos. He finds an architectural labyrinth full of repetitions and deceptions that end his life.

All the stories provide a conventional narrative disclosure associated with the protagonist's death. However, the transformations and the reflections establish oscillations, digressions as well as new points of departure, or movement towards new narratives. They seem to indicate that a narrowly defined linear sequence with a beginning and an end is only one of the possible ways in which we can read these fictions.

As the characters advance in the stories, the physical experience of the places they occupy becomes a metaphor for the linear progression of the narrative towards an end and a solution. Burgess has suggested that the narrative techniques employed by Joyce and the retelling of the *Odyssey* make a bridge for the marching across the chapters (1982: 87).¹³ It may be said that the three places are spatial models for the marching across the disorientations and reflections in Borges' fictions.

Models can have a resemblance between the thing that is represented and the representation itself or can be arbitrary and widely accepted by social convention. In all stories the depiction of space is locked to the movement of the central character. It has a human scale and we as readers can either visualize the rebellious events in Dublin's streets or can discern details and experience sensations we would feel if we were marching in the English countryside, in the cityscape or in Triste-le-Roy. It is thus not the form of the three places that carries the content of the labyrinth. It is the nature of their depiction which shifts at eye level with the character's movement and is bound to temporality, from the moment Kilpatrick enters Dublin to the moment he is killed, from the time Yu Tsun leaves his flat to the time he is arrested by Madden, from the moment Lönnrot's eyes meet the belvedere of Triste-le-Roy surrounded by trees from the garden, to the moment he looks back at the trees, through the latticed windows of the belvedere.

Borges juxtaposes the vision that unfolds in temporal sequence with another vision, which is static like the cityscape seen as a map and the landscape as panorama. The two ways in which space is rendered remind us thus of the ways in which cartographers, city planners, landscape designers and architects look at space as a sequence of visual fields and as an overall framework where all spatial moments are concentrated on a single instant, on a flat plane, the surface of a map, an aerial photograph or a building plan.

Against the two places of informality, the city and the landscape, stands a tiled surface of symmetry that links characters and events independently from their position in the narrative sequence. The third setting, the villa Triste-le-Roy, is the only place where narrative progression, space and geometrical order merge into oneness. Here Lönnrot is deprived of the external point of view, the point where he stands to draw the diamond shape on a map. His relationship to the geometrical order of the house is a physical one from which he finds no escape.

If a narrative structure employs geometry and symmetry to entice the reader into the plot, then architecture is different from literature. The reader-viewer is already captive inside its spaces. We come to the most fundamental of Borges' propositions: literature creates representations of space, whereas architecture creates actual physical space, which we occupy with our bodies. However, in spite of this difference, the symmetry of the house alludes to the symmetries in the narrative. It suggests that although the reality of space separates architecture from literature, the mode in which they are experienced and certain tools of construction, concerning temporal sequence and the organizing framework of geometry, can be fundamentally similar. Finally, the analysis of the stories reveals that the analogy between architecture and Borges' fictions is also found in the history of philosophical ideas about nature, infinity and cosmic order.

At this point the analogy between literature and architecture may be revised. It was said above that the former is concerned with representations of reality whereas the latter with the actual constitution of space. It was also said that they have a representational function in their capacity to embody and reflect philosophical ideas. However, to confine architecture to the actuality of spatial construction or to the referential powers of symbolism would be similar to reducing Borges' fictions to storytelling or his fictional spaces to an actual image of labyrinths.

Architecture and fiction for Borges do not represent reality as it actually is. They are attempts to express *what reality actually lacks*; that is, an underlying framework, a perfect order that can explain the conflicting empirical and time-bound aspects of everyday life. This is Lönnrot's last discovery as he emerges from the solitude of the villa to face his irrevocable death. The house whose name means 'the sad king' 'does not speak or tell' about a universal order of infinity, 'but indicates through signs'. It is an illusion of infinity, of a universe mapped out in the image of a clear and rigorous geometry. It allows us to move inside boundaries that give shape to things that in reality are separate and distinct. It has its own ontological structure and like chess is the domain of possibility, where new combinations, new discoveries, new games are hidden. To play and invent, in the kingdom of our intellect, in boundless time, in invisible solitude ... while Red Scharlach is waiting in the belvedere.

From architecture to narrative

Borges is often considered as the first of the so-called post-modern authors who negate the formulation of history as a steadily unfolding sequence of events with a conclusive ending, and often turn this negation to the subject of writing. Calvino's *Invisible Cities* consist of chapters which, although linked by conceptual relationships (Peponis 1997a: 40), possess autonomy and can be read individually, skipping large parts of the book, or circulating into its sections in many different ways. In his novel *If on a Winter Night's a Traveller* Calvino accentuated the openness of the narrative further, inserting unfinished stories into the plot, which also incorporates the reader, whose main task is to explain why these stories have no ending.

A parallel architectural movement in the late twentieth century emphasized the absence of anthropocentric space, of a single viewpoint and the celebration of fragment and disjunction over oneness. Underlying these ideas are developments of thought that stressed the presence of multiple universes, the multiplicity of consciousness and an apparent chaos in social structures. For Robin Evans the idea of a society that has suddenly fallen out of order is a 'demonstrable fiction'. 'There was never such age with such state of mind. There was only art which gave that impression from certain points of view, so that the imagination could feed what the intellect could not accept' (1995: 103).¹⁴ The task of art is to establish a continuum among contradictions, like the centralized Renaissance churches which represent the universe as wholesome and ordered. The study of Borges shows that narrative has the same function: it represents multiple worlds based on conflicts, and satisfies our desire to see their contradictions expressed into carefully crafted propositions.

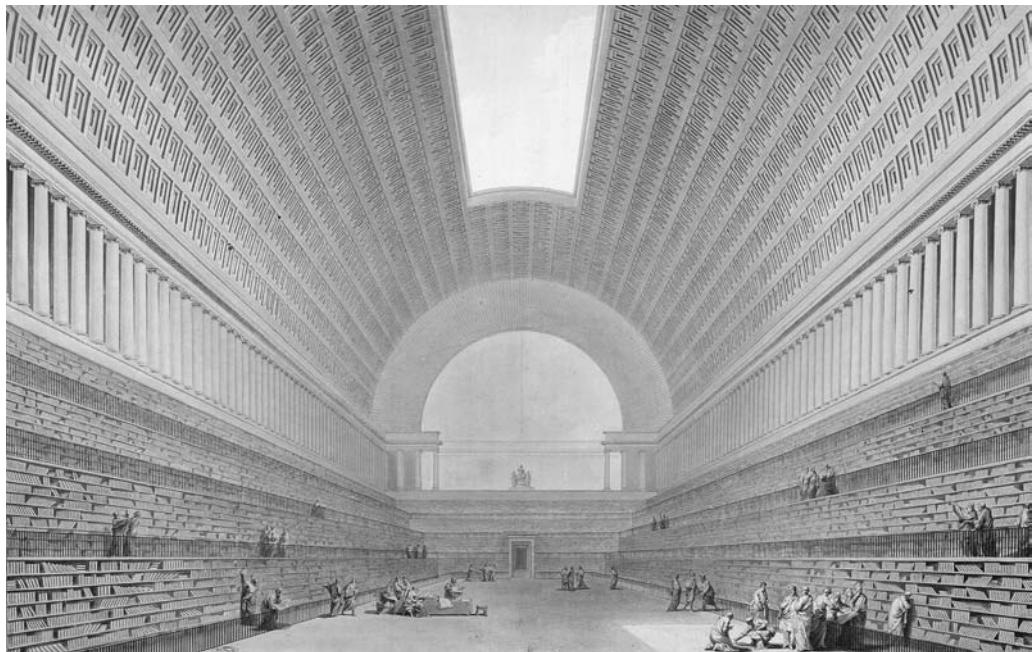
Borges' influence on writers like Calvino is immense. His narrative structure establishes movement towards itself, towards other existing narratives and

finally towards narratives, which are not realized yet, but are latent in the text. This is achieved within extremely condensed stories that are complex and simple enough to satisfy a large public.¹⁵ Most significantly, in contrast to post-modern approaches, he does not decompose his narratives (which, in spite of their oscillations, progress linearly) in the traditional narrative fashion.¹⁶

Architecture also constructs worlds that appear 'closed' or open-ended. Buildings can be like the villa Triste-le-Roy, utterly symmetrical, or like the Barcelona Pavilion constructing a tension between symmetry and asymmetry, or like a city, informal and irregular. In most cases they offer many rather than a single way to move inside them. Some buildings, however, together with multiple routes, provide one path, which enables the viewer to experience them in a sequence. In the Burrell Museum discussed in Chapter 7, a clockwise movement along the periphery of the layout brings the visitor back to the point of departure (see Figure 7.2a, b). In the Museum of Scotland a peripheral route allows one to skip the exhibition spaces and reach the top of the building, offering views to the city and its monuments (see Figure 7.1a). In villa Savoie the route twists inside the house in an upward movement, bringing the visitor to the roof terrace. The penetration of a building from one side to the other and from the bottom to the top expresses the capacity of architecture to function as spatial narrative. Crossing a boundary that separates the inside from the outside is like entering a fictitious world, like opening a book to read a story. When architects offer a linear path they emphasize one route out of many. This route identifies one of the ways they might want us to see the building: as sequence within the organizing framework of geometry. This might explain why elements of transition such as entrance halls, ramps, stairs, passages, ante-chambers and roof terraces are the most favourite elements in architects' vocabularies, defining moments from entering to leaving and from progressing to arriving. The task of Borges has been to expand a single route into many, using digression and multiplicity. These buildings move in a similar direction: they condense digressions into one path or as few paths as possible, while also offering an interconnected network of paths that can enrich exploration.

Conclusion

We can now return to the observation made in the introduction of this chapter. Architecture is a thing in so far as it renders itself to be experienced, and an activity that deals with the conceptual organization of the parts into a whole. The thing being the whole and the parts constituting the whole bring us to Zeno's paradox, or to Borges' labyrinths. The aesthetic experience is determined by a desire to organize the patterns of this world into meaningful wholes described as conceptual entities. At the same time it is fundamentally locked into reality consisting of infinite aspects that unfold sequentially. We take as much pleasure in the parts as in understanding the whole, as much satisfaction in lingering with our senses at work, as in grasping patterns with our intellect in full power.



4.0
Boullée, *Vue
Perspective de
la Nouvelle Sale
Projettée.*

Chapter 4

(Th)reading the Library

Spatial and mathematical journeys in Borges' *Library of Babel*

‘Perhaps I have created the stars and the sun and this huge house, and no longer remember it’.

– Borges, J. L. (2000), *The House of Asterion*, in *The Aleph*, trans. A. Hurley, London: Penguin Books, p. 53.

Introduction

Despite their obvious differences, buildings like libraries, museums and archives have a similar identity. They all contain and influence human knowledge and culture. The expressive strength of these places is based on their function as repositories of knowledge. But it often relies on the physical arrangement of their spaces and their capacity to encompass a scientific or philosophical message. Richard Owen's plan of the Natural History Museum in London, for example, expressed a taxonomic model of the study of nature (see Figure 6.1). The distribution of galleries and the circulation in the building carried the idea of an encyclopaedic approach to the organization of knowledge.

But no museum or library equals the architectural strength of Borges' breathtakingly vast but rigorous and precise *Library of Babel*. Borges constructed an enigmatic library-universe in the image of a labyrinth, composed of an infinite array of hexagonal galleries. The Library houses an indefinite number of books, containing everything that has been written or is possible to exist including every permutation of letters in every language. Borges' description of a hexagon and its spatial connections in the opening paragraph is so detailed and clear that a drawing of the layout must have assisted him in the development of the story. However, apart from the strong images of staircases thrusting into infinity he invoked in our mind, he did not provide with a map or specify a way to navigate through the hexagonal galleries.

Architecture and language are closely related in Borges' fictions. Primitive structures and topographies in remote places, like the abandoned city of *The Immortals*, an antique construction depicted by a classical traveller, are used to embody the sense in which we control and yet are controlled by space and language (Faris 1988: 4). But in *The Library of Babel* architecture and language are so entangled

with each other that the architectural expression becomes an integral part of the narrative content. The Library *is* the universe; its architecture forms the *universal substance*. So, the underlying dilemmas in the story of whether the universe, or by allegory the Library and its books, have a meaningful design becomes implicitly a question of whether its architecture can have a meaningful pattern for navigation and orientation.

Threading the Library of Babel becomes the starting point of this chapter. The questions I am trying to answer are: What kind of labyrinth is implicit in Borges' description? Has the author implicated a system of movement that has an ordered structure, or has he constructed an environment that confirms the fears of the narrator for a meaningless universe? If one traces the possible spatial connections and paths inside the Library would they generate a pattern, a recognizable form like the sum of the artist's creations in *The Maker* that constitute a labyrinth comprising his own face?¹ Following evidence from the text I will explore the route system inside the Library. As the Library is meant to portray a labyrinth of language and thought, the second task is to examine the narrative structure of this fiction and see how it relates to the trajectory of movement. It is argued that from all the possible routes in the Library one is most representative of Borges' philosophical ideas in this story and in his other fictions. The Library of Babel has a meaningful spatial design that stands in a specific relationship with the narrative structure and content.

The Library of Babel²

Borges opens the story describing the Library as an allegory for the universe. He then presents the layout as a space-filling pattern of hexagonal rooms.

The universe (which others call the Library) is composed of an indefinite, perhaps infinite number of hexagonal galleries. In the centre of each gallery is a ventilation shaft, bounded by a low railing. From any hexagon one can see the floors above and below – one after another, endlessly. The arrangement of the galleries is always the same: Twenty bookshelves, five to each side, line four of the hexagon's six sides; One of the hexagon's free sides opens onto a narrow sort of vestibule, which in turn opens onto another gallery, identical to the first – identical in fact to all. ... Through this space, too, there passes a spiral staircase, which winds upward and downward into the remotest distance (2000c: 65).

Constructing an image of three-dimensional tessellations Borges enables us to perceive the Library all at once, as a total formation. He then presents it from the interior viewpoint of the narrator, a librarian once a traveller to other hexagons that is now waiting his death, near the hexagon of his birth. The Library is filled with random books, but its occupants search for order to explain the universe, or look for the Book, the compendium to the indefinite number of volumes. Yet, in spite of numerous speculations, the Library is impenetrable and unknown. The titles of volumes do not prefigure their content, and the words in their pages do not have intelligible meaning.

Centuries of investigation led to a theory that seemed momentarily to explain the Library's secrets: 22 letters of the alphabet, the space, the comma and the period are the essential elements of all books. The Library contains all possible combinations of these symbols and eventually all possible knowledge: volumes that are written and will be written, and those that are possible to exist. This discovery instigated pointless searches for the Book containing the universal order of things, and for the 'Vindications', where librarians can read the prophesies of their lives. Searches took various forms from shuffling letters to produce 'canonical books' to eliminating volumes that are worthless and misleading. Disillusioned and spiritually exhausted, the narrator ends the story with a speculation of his own: the Library has a periodic and infinite cosmological order with its volumes repeating themselves in remote and impenetrable regions.

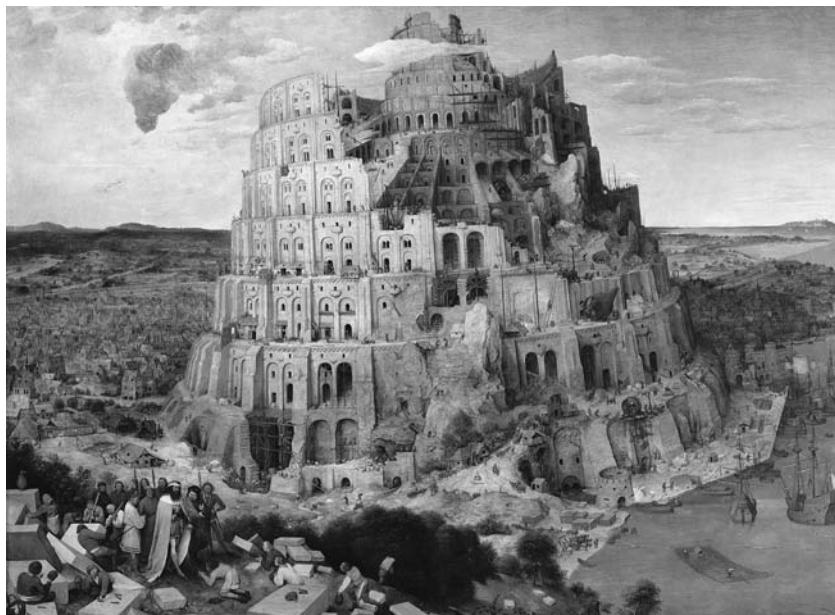
If an eternal traveller should journey in any direction, he would find after untold centuries that the same volumes are repeated in the same disorder – which, repeated, becomes order: the Order. My solitude is cheered by that elegant hope (Borges 2000c: 73)

The search for the perfect language

Using architecture as an allegory for language and language as an allegory for the universe Borges renders the Library as philosophical dilemma and as a poetic image. The infinite Library, the indefinite number of books and their incoherent convolutions contrast the finite and irreversible trajectory of human life, the limited self confined inside hexagonal cells, and the failures that outnumber successes in reading divine order out of worldly chaos. The Library expresses the gap between the total perception of the world laid out as infinite possibility and the time-bound life of humans whose destiny to experience a system from within prevents them from grasping its construction. But it also evokes the history of ideas in philosophy, linguistics and mathematics as a condensed and poetic message. This chapter focuses on how these ideas are synthesized through architecture. But before looking at the Library as an architectural construction, it is essential to locate it in a philosophical and historical context.

The origin of the Library is in the biblical story in Genesis 11. The whole earth used one language and one speech, until humans tried to erect the tower of Babel to reach the heavens. God punished their arrogance by confounding their language (see Figure 4.1). The tower served as an explanation of the different languages spoken on earth. But it also formed the starting point for restoring the 'first language' used by Adam when he named all living creations. The Library thus models something like the European 'search for the perfect language'. This search was influenced from the explorations found in the Kabbalah, a Hebrew mystical current that considered the creation of the world a linguistic phenomenon (Eco 1997: 31).

The preoccupation in the Kabbalah was the discovery of the eternal Torah, consisting of the arrangement of letters that at the moment of creation were not joined up to form words.³ 'For the cabbalists, God will abolish the present ordering of these letters, or else will teach us how to read them according to the new disposition,



4.1
Breugel Pieter the Elder, *The Tower of Babel*.

after the coming of the Messiah' (1995: 26). One branch of the Kabbalah established sacred references to the 10 hypostases of God (10 Sefirot) representing the ways in which the universe expands into infinity. To read was equivalent to doing an anatomy of the text in which meaning was found not only in its literal content but also through allegorical, hermeneutic and mystic interpretation. Metaphysical reality could be reached through various techniques like combining the initial letters of words to derive new words (acrostics), producing anagrams, and calculating a numerical value for each word by summing the numbers of its letters (1997: 27–8).

The Kabbalah had an impact on Western philosophy, through the studies of Raymond Lull, Giordano Bruno and Paul Guldin. In his *Arts Magna* Lull proposed an alphabet of nine letters using mathematical combinations. His purpose was to combine concepts expressed as values and dignities and produce a number of universally held propositions. Bruno devised a more complex system of combinations including Latin, Hebrew and Greek letters.⁴ While Bruno and Lull developed a language based on abstract concepts, Paul Guldin used pure permutations of alphabetic sequences that were 'controlled by no orthodoxy other than the limits of mathematics itself' (1997: 140). Eco explains that Guldin calculated a number of possible combinations generated by 23 letters.⁵ He arrived at 70,000 billion billion locutions. These could be written using more than a million billion billion letters. If these words were to be included in books, each consisting of 1000 pages with 100 lines in each page and 60 characters in each line, 257 million billion books would be needed. Guldin imagined room circulation and shelf space in cube shaped libraries the sides of which measured 432 feet. Each library could house 32 million volumes. The number of cubic buildings required to take all books was 8,050,122,350. Using

the total available surface on earth would not suffice to construct the entire number of library buildings.⁶

Like Guldin's volumes, the Library's books derive from 'endlessly repeating variations' of the 22 letters. From those incontrovertible premises, the librarian deduced that the Library is 'total' – perfect, complete, and whole – and that its bookshelves contain all possible combinations of the twenty-two orthographic symbols (a number which, though unimaginably vast, is not infinite) – that is all that is able to be expressed, in every language (Borges 2000c: 69).

Borges combines two intellectual traditions: the Kabbalah and its search for infinity and languages that were artificially derived to satisfy interpretive purposes like those of Bruno and Lull, or mathematically driven like Guldin's combinations. The Library expresses constructing the world through language as divine order and representing the world through language as human creation. Its dual nature carries dilemmas that influenced the Western European discourse: was there an original divine tongue that became lost? Were languages differentiated as a result of divine punishment or as a result of a natural process? Is there a secret universal order and how does it match the thought systems like language, mathematics and art used to interpret the world?

The myth of the labyrinth

Another origin of the Library is the classical myth of the labyrinth. Built by Daedalus in Crete, the labyrinth concealed the Minotaur, a monster that devoured sacrificial victims.⁷ Once every nine years seven young men and seven young women were sent to Crete from Athens as a tribute to its dominion over the Aegean islands, and placed in the labyrinth. Theseus, the son of the Athenian king Aegeus, was once among the 14 to be sacrificed. Ariadne, daughter of the Cretan king Minos, gave the hero a golden yarn. Theseus fastened the yarn to the entrance of the maze and unwound it as he proceeded to the centre. He slew the Minotaur and followed the golden thread back to the exit. Fleeing from Crete, Theseus and Ariadne stopped at the island of Delos where they performed a ritual dance, recreating through their steps the path through the labyrinth.



Track sequence: 0 3 2 1 4 7 6 5 8

4.2

Cretan labyrinth.
The sequence of tracks progresses from the outside to the inside repeating the same steps in reverse order as it unwinds to the exit.



4.3
Watts, *Minotaur*.

No evidence has been found of a relationship between the myth and archaeological facts. However, representations of the labyrinth in Cretan coins and Hellenic vases exist, showing a twisting path in eight levels or tracks (starting with 0 from the outside) that moves towards the centre with a single point of entry and exit (Wright 2001: 9) (see Figure 4.2). The ancient myth was transferred in the Middle Ages into Christian symbolism expressing a pilgrim's route and a spiritual trip towards redemption. Borges has used it extensively in poems and fictions to signify the quest for meaning hidden away in the centre of a meandering path. His most direct reference to the Cretan maze is in *The House of Asterion* narrated by the Minotaur (Asterion) and based on his solitary existence in a vast house (see Figure 4.3) (Borges 2000c: 51–3).

Self-reference

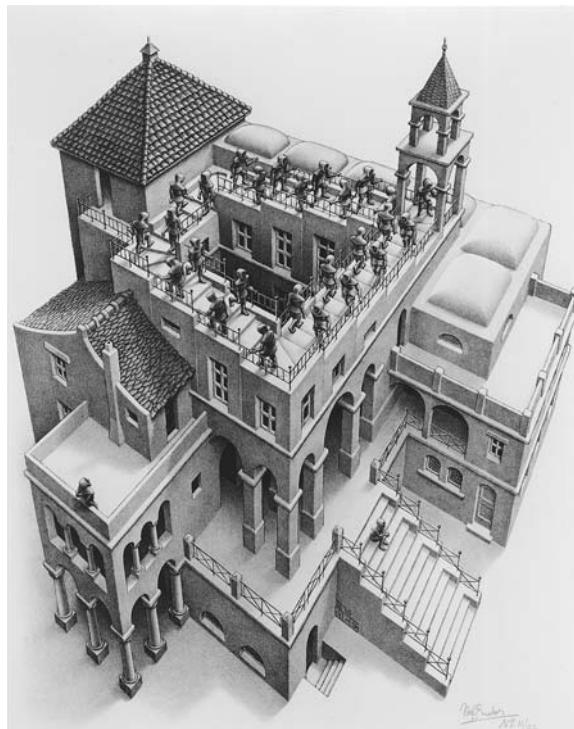
The allusions to myths and philosophical dilemmas in the story show that the Library is a labyrinth containing stories of other 'labyrinths'. These stories evoke in a shorthand fashion the history of philosophical ideas and their origin in oral tradition. But they also provide evidence that the Library contains everything that has been expressed, including Borges' *Library of Babel*, since it has been already prefigured in European discourse. The fiction is thus self-referential, reflecting its own narrative content. Self-reference is frequently used by Borges in the form of stories inserted in other stories to express the idea of a pattern that expands into infinity.⁸

Using the paradoxical artistic constructions of Escher, Douglas Hofstadter

explains the notion of self-reference as a 'strange loop'. This loop occurs 'whenever, by moving upwards or downwards through the levels of some hierarchical system, we unexpectedly find ourselves right back where we started' (1979: 10). Escher produced different types of strange loops, blurring the distinction between real and mythical worlds. His loosest version of loops is in *Ascending and Descending* (see Figure 4.4), involving many steps before the starting point is regained. A tighter version is his *Drawing Hands*, which depicts two hands drawing each other consisting of two steps, while the tightest of all loops is found in his *Print Gallery*, 'a picture of a picture that contains itself' (1979: 15).

Self-reference expresses the conflict between an infinite process departing from and returning to the initial point, and its representation in a finite way (1979: 15). Since the Library is total, it follows that Borges' fiction *The Library of Babel* must be contained somewhere on its shelves. A similar proposition is made by Marcus in that texts like 'inventories, lists, guides, indices, handbooks, bibliographies and catalogues', which summarize the material of libraries, stand outside them, but they are also identical to the objects to which they refer: books.

Yet they are also texts, so that the catalogue of a particular collection may contain an entry to itself. The logical effect of this is as disturbing as the visual one of the Klein bottle or the doughnut whose continuous surface makes its hole at once inside and outside. To avoid such ambiguity, the catalogue is given a special position, not shelved 'inside' under the



4.4
M.C. Escher,
Ascending and Descending.

appropriate class. ... The books it refers to cover the totality of knowledge (1993: 192).

Since *The Library of Babel* is shelved inside the Library the fiction and its content are linked through a strange loop breaking the hierarchical boundary that separates the real from the fictitious world. A second strange loop is in the notion of a universe that contains a book that contains the universe.⁹ A more complex one is implicit in the suggestion that in the Library there are 'leagues of senseless cacophony verbal nonsense and incoherence' (Borges 2000c: 67). What follows from this is that the librarian's tale must also lack meaning. If this proposition is true, the first suggestion loses validity, as a phrase that is contained in a meaningless story. But if the first statement is false and the Library does not contain misleading books, the final statement becomes also immediately cancelled. The logical structure of these statements is mapped in the following sentences:

The Library contains meaningless volumes (Statement 1)

The Library of Babel is a story contained in the Library (Statement 2):

Then: *The Library of Babel* is nonsense (Statement 3)

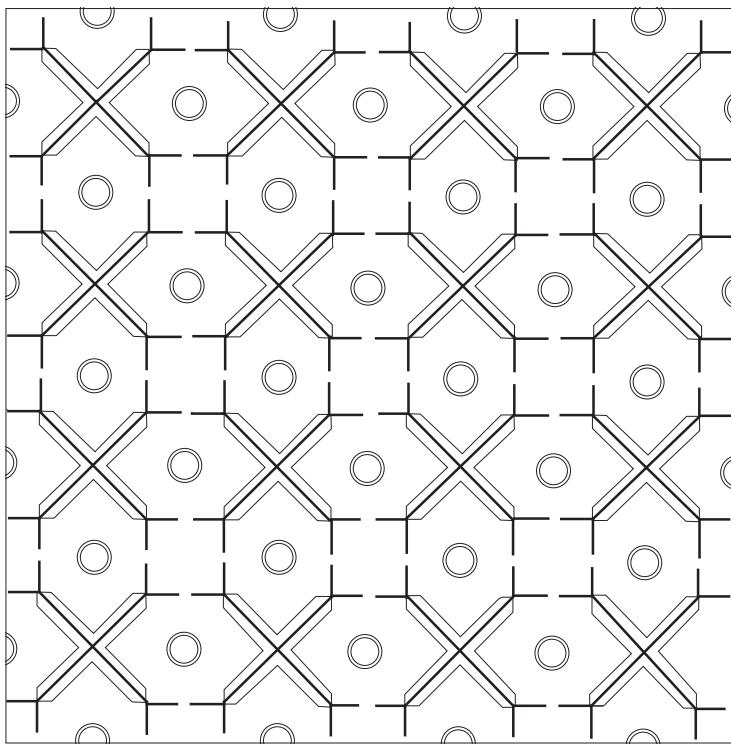
If statement 3 is **true**, then statement 1 is false (as a statement contained in a meaningless story). If statement 1 is false, then statement 3 is **false**. Statement 3 has the paradoxical nature of being both true and false. Strange loops contradict our habitual understanding of sentences as being exclusively one or the other.¹⁰ Such paradoxes found mathematical translation by Gödel (Hofstadter 1979: 17). In his 'Incompleteness Theorem' (1931) Gödel showed that there are propositions that cannot be proven within a mathematical system or are inherently insoluble (Gödel 1962). Cantor's work on infinity and the theory of sets was also related to this theorem, formulating that there is always a larger set consisting of all subsets of a given set. Within any limited system, there are entities that cannot be proved or perceived. To comprehend them we need to move up to a larger system, a concept that is often illustrated using the example of Russian dolls (Aczel 2000: 195).¹¹

The narrative maze

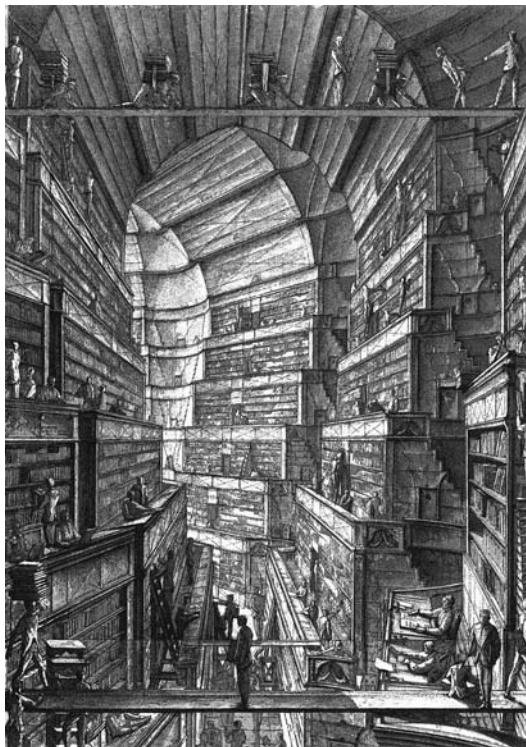
The strange loops in the story reinforce the idea that the Library and its books form a labyrinth of obscure meaning. But it is not only self-reference that creates the feeling of disorientation and being lost in a maze. It is also the numerous self-conflicting theories trying to resolve the philosophical enigmas in the story. None of these theories offers a final solution as they all cancelled or contradicted. So, the infinite extension of space is challenged by the presence of mirrors that create the illusion of infinity. All rooms are identical hexagons, but there is a 'mystical' claim for a circular chamber containing an enormous circular book. The universe must be the handiwork of a god, but the divinity is manifested in the symmetry of typescript letters. The 22 letters define the modular order of all books, but they produce incoherent formations. Words might be in ancient or distant languages, but no language can sustain 410 pages of the same three letters. The Library contains all knowledge, but there

is zero probability of finding one's Vindication, a divine language, or a book that is a compendium to all volumes. Shuffling letters can produce meaning, but equals mimicking the divine disorder. Destroying meaningless books can help to eliminate disorder, but in the vast universe there can be only an infinitesimal destruction of volumes. There are no two identical books in the Library, but there are thousands with a difference of one or two letters. Disorder might be the rule in the universe, but there is a hidden meaning for any incoherent sequence of letters.

Instead of bringing the line of reasoning forward through irreversible propositions Borges employs paradoxical loops and a shifting sequence of hypotheses that are refuted to create a disorientating reading experience. The concept of the labyrinth is built into the text, calling attention to itself as a philosophical and spatial device. If a reasoning path is laid out as a maze, the spatial labyrinth must play a larger role in illuminating the story. Using Borges' description in the opening paragraph I will attempt to map the route in the Library. If our hypothesis is correct the path through the labyrinth could be a key to the Library's narrative and philosophical space. It is important to clarify that this path is not seen as a literal translation of the route through the hexagons in the Library, but as an abstract model for *representing* the narrative structure and navigating through the narrative content.



4.5
Plan of *The Library of Babel* by Cristina Grau.



4.6
Erik Desmazières,
*Haute galerie
circulaire*.

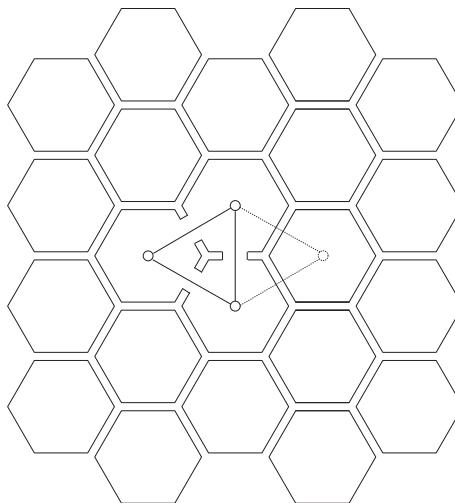
Threading the labyrinth

The extraordinary geography of the Library has inspired many artists and architects who have represented it either as a space-filling pattern of shapes like Grau (1989: 68) (see Figure 4.5), or as a Piranesian interior, like Desmazières (see Figure 4.6). Grau's diagram shows a spatial arrangement of irregular hexagons interconnected through rings of circulation. But the regular geometry used by Borges in other fictions, and the contrast between a conceptually ordered absolute space and a perceptually disorientating empirical space he constructs, suggest that the galleries are perfectly regular hexagons. Additionally, as the labyrinth in the story matches the reasoning labyrinths in the text, the arguments constantly shifting towards a new direction in the linear motion of language, and the paradoxical loops, imply an unbroken and meandering route rather than one that bifurcates at each space.

To investigate this let us take three hexagonal units (see Figure 4.7). If these units are interconnected forming a circuit, there is no possibility for a doorway linking with a fourth hexagon, as there should be only two openings in each space. In the context of all hexagons expanding to infinity any circuit would form a sub-system. Paths in the Library can be disconnected from each other forming sub-labyrinths in circuits or sequences extending along one or more directions (see Figure 4.8). However, the narrator's final statement about 'an eternal traveller [that] journeys in any direction ...' suggests that the Library is a continuous, permeable and navigable system. Not only is it possible to move along all possible directions in the hexagonal

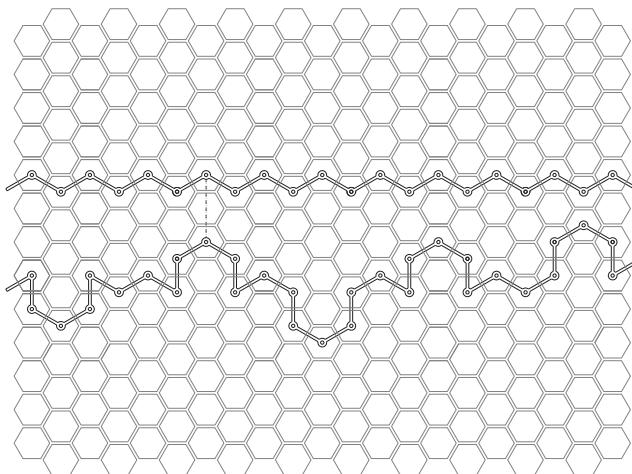
4.7

Spatial connections in three hexagons. If three hexagonal units are interconnected forming a circuit, they cannot connect with a fourth space as this would require more than two openings in two of the rooms.



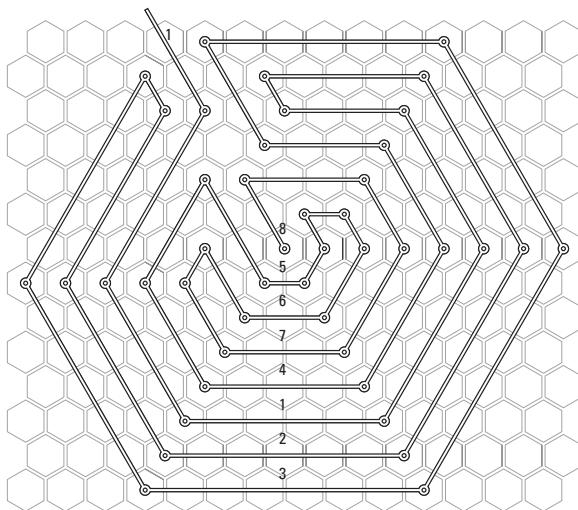
4.8

Possible routes in the Library. The two paths cannot be linked (as shown in dotted line) as this would mean that two hexagons have three rather than two points of entry and exit.



tessellations but also, like words in a text, any space can be accessible through a trip that crosses all other spaces in a linear sequence. An analogical relationship between a path through a text and a path through the labyrinth, like the one that Borges implies, requires that the latter is a continuous, meandering, non-self intersecting (without circuits) line on a two-dimensional surface, as in the Cretan labyrinth.

Based on the strong influence the Greek labyrinth has exerted on Borges' fictions, I will use this pattern, and adapt its geometry to the hexagonal geometry of the galleries (see Figure 4.9). If we label the eight concentric levels starting with 0 from the exterior and moving to level 8 at the centre, we produce a sequence of tracks progressing in the following way: 32147658 (Phillips 2001).¹² There are 15 paragraphs in the fiction and 15 tracks as we move from the entrance to the centre of the Cretan labyrinth and then back to the exit (Figure 4.2). There is also



032147658

a numerical symmetry with respect to paragraph eight, and route symmetry with respect to track eight.

(321476585674123).

For Anthony Phillips the Cretan labyrinth falls into the topological classification of 'simple alternating transit mazes of depth n '.¹³ These must satisfy three necessary conditions: the sequence starts with 0 (exterior) and ends with n , odd and even integers alternate, and the path changes direction between consecutive levels. Many ancient and medieval labyrinths had a symmetrical structure, which is apparent from a distant view but difficult to discern from the ground.¹⁴ The mirror was another favourite sign used by intellectuals in medieval times. The topological structure of the Cretan labyrinth and the frequent use of the dual model of mirror and labyrinth by Borges can help formulate the hypothesis that the Library has a symmetrical structure in terms of its route as well as in relation to its narrative design.

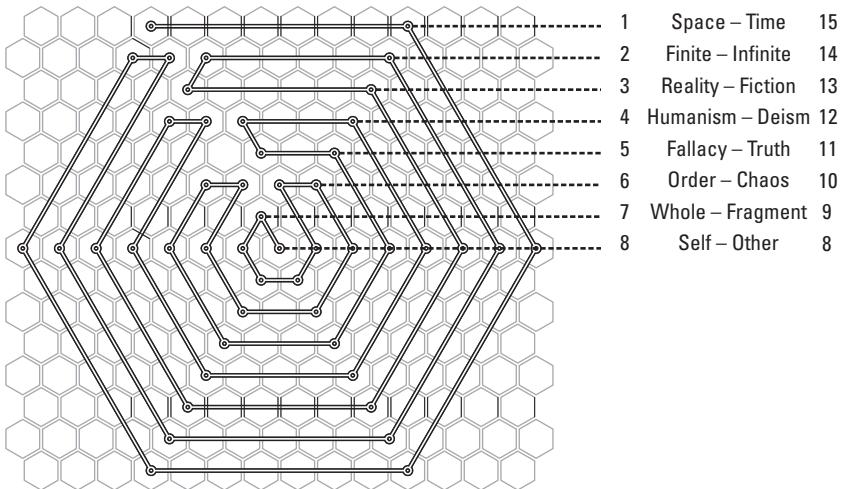
We can define a simpler maze than the labyrinth in Crete, progressing in the sequence of natural numbers and matching the sequence of the paragraphs in the story (see Figure 4.10). This labyrinth reproduces the text with each paragraph captured by a hexagonal track and the gaps between the paragraphs occurring when

4.9
Hexagonal adaptation of the topological pattern of the Cretan labyrinth. The sequence of tracks from the outside is :032147658. Note that the hexagonal diagram translates the path through the circular labyrinth rather than its physical structure.

4.10

Hexagonal labyrinth. A model route through the Library. This route also represents the succession of paragraphs in the text. Each paragraph is captured by a hexagonal track, while the gaps between the paragraphs are expressed by a change in direction and topological level. This route captures:

- (1) the rule specifying that each gallery has two spatial connections with the adjoining galleries in the story,
- (2) the topological definition of 'simple alternating transit mazes' (Phillips 1993),
- (3) the sequence of natural numbers,
- (4) the sequence of paragraphs in the story,
- (5) the topological symmetry in the route structure and the schematic symmetry in the paragraph content (1–15, 2–14, etc.).



the path changes direction and level. This pattern has route symmetry, reproducing itself in reverse order as it unwinds from the centre. This seems to suggest that in the second half of the fiction we might encounter the same steps as in the first part, as though we are moving backwards in space and time. So, it is possible that a thematic symmetry in the paragraph content exists with respect to paragraph eight.

Threading the narrative

At this point I will attempt a second reading of the fiction, starting from the edges and looking at the pairs of opposites we encounter with respect to paragraph eight as I progress to the centre. I will suggest that symmetrical relations group antithetical concepts beyond the place they hold in the paragraph sequence. I will then discuss the implications of this structure in the story and its philosophical content.

In the opening paragraph the Library is described as a total geometric construction (paragraph 1). In the closing paragraph it is seen as a periodic repetition of books to be discovered by an eternal traveller (paragraph 15). The start and the end of the fiction relate an absolute notion of space we can grasp at once to an empirical notion of space based on temporal sequence.

The second paragraph contrasts the life of the narrator, reaching the end of its course with the infinite fall of his body inside a Library shaft (paragraph 2). In paragraph 14 the finite-infinite contrast extends to include the destiny of humanity approaching extinction against the eternal and vast Library.

The third paragraph refers to a lack of correspondence between the book titles and their content (3). But since the Library contains all knowledge a justification for nonsensical titles (like *Combed Thunder* or *Axaxaxas mlo*) exists, buried somewhere in the universe (13).¹⁵ Alazraki suggests that each discipline constitutes a system of signs that can operate and make sense only within its own framework. 'Transfer those same signs that are part of a given system to a different one and the sense becomes nonsense, their relevance loses ground, their reality turns into

unreality or what amounts to the same, into fiction'. (Alazraki 1986: 49). Assigning meaningless words to potential linguistic systems that can be meaningful but unknown Borges blurs the distinction between languages that are real and those that are possible, or cultural convention with nonsense, poetry or fiction.

The notion of God as 'primordial designer' is brought up next as an answer to the problems posed by the Library (4). An alternative theory is a belief that a book exists, which is 'a cipher and perfect compendium to all other books, and some librarian must have examined this book; this librarian is analogous to a god' (12). A book becomes symmetrical to the Library since it contains its secrets; a god becomes similar to a librarian, implying symmetry between Humanism and Deism, artefacts and nature.

The Library contains endless leagues of books that are fallacious and misleading (5). Some librarians tried to eliminate them but achieved only an infinitesimal reduction of volumes. In a universe where hundreds of books differ by no more than a single letter every copy and every original acquire the same validity (11). Truth and folly are identical, turning humans to powerless agents in the construction or the destruction of meaning.

A hypothesis put forward in paragraph six is that the hidden order of books can be explained by using a code (6). In paragraph 10 librarians start from the opposite premises and using dice and metal discs shuffle letters to produce canonical volumes (10). Deciphering languages based on codes is compared to deriving new languages through probability, bringing us close to the combinatorial systems of Guldin, Bruno and Lull. In his essay *Ramón Lull's Thinking Machine* Borges explains that Lull's rotating discs were philosophically absurd. But as literary devices they model the poetic thought process and its search for startling combinations of words that modify their meaning (2000: 159). Codes in the service of meaning and random combinations used to transfigure it are made symmetrical, narrowing the gap between order and chance, the conventional systems of communication and their poetic manipulation in fiction.

The discovery that all books contain combinations of the 22 letters made the Library momentarily lucid (7). The universe can become knowable, encompassing everything that has existed or is conceivable to exist. But if combinatorial entities are human creations incapable of expressing the true nature of things, a linguistic system of a higher order construction must exist that can capture the infinite universe (9). The seventh and ninth paragraphs introduce a dialogue between whole and fragment, a language that is extraordinary and divine and human languages that are ordinary and incomplete. As our synchronic reading approaches the thematic centre of the fiction in paragraph eight, we come closer to the philosophical dilemmas underlying the Kabbalah and the European search for a perfect language.

Discovering that the Library contains all knowledge, the librarians look for their own 'Vindications' (8). The scenes of methodical scholarship invoked throughout the story are replaced by feverish activity that leads to destruction. Rushing along spiral staircases, the archivists strangle each other, hurl books down ventilation shafts or are hurled 'to their deaths by men of distant regions'. But the book that contains their representation is not found hidden among billions of others.

At the heart of all opposites in paragraph eight is a relationship between the *self* and the *cosmos*. The limitations of grasping the Library are equivalent to the limitations for knowing the mind deprived from an external position. Hofstadter proposes a metaphorical translation of self-reference into self-knowledge (2000c: 697). Stepping outside the mind to read its mental structures implies two domains connected by a strange loop: the mind as the object of observation and the agent that observes – an effect similar to two mirrors that face each other. The fall of bodies and books inside ventilation shafts carry this message metaphorically, while the shafts express arrival at an empty centre, a point of infinite regress.

To discuss the significance of these symmetries we need to look again at the pairs of concepts encountered on the way to the centre (Figure 4.10). These relate to binary oppositions like space versus time (1–15), finite versus infinite (2–14), everyday language versus poetry and fiction (3–13), human versus divine (4–12), fallacy versus truth (5–11), order versus chaos (6–10), whole versus fragment (7–9) and finally a universe that we perceive as incomplete as opposed to one that is perfect and whole. These opposites express the gap between the world as a total formation and the limitations in grasping it as a whole based on human experience. They carry associations across higher levels of meaning like conceptual and perceptual, universal and particular, abstract and concrete, invariable and variable, eternal and ephemeral, synchronic and diachronic. They converge on an opposition between intellectual order and sensory observation, or Plato's distinction between eternal ideas and forms and their representations.

In his foreword to *Fictions* Borges expresses his debt to Lewis Carroll for his influence in this fiction (2000c: 5). In Carroll's *Through the Looking Glass* Alice moves through a house reflected in a mirror and the garden outside it. The mirror in the vestibules of the Library suggests that *The Library of Babel* reproduces itself backwards as in the looking glass house. The implication is that underneath the semantic surface of the text speaking of a probabilistic composition of words and labyrinthine spaces there is an ordering pattern. The overlay of the conceptual framework on the linear progression of the story articulates the relationship between purposeful design and inexplicable chaos, akin to the opposites embedded in the Library and to the librarians' search for order. The Library as universe might be the work of a creator or the outcome of chance. But as a story it is produced by an author that is recognizable through a carefully crafted construction.

This construction is based on gathering a range of ideas from human knowledge and stringing them together in sequence. But it is also based on overlaying a pattern of symmetry on the constituent theories along this path, enabling them to exchange positions. This strategy is similar to the strategies discussed in the previous chapter, suggesting that Borges groups a range of phenotypical narrative units under a single genotypical category divided into victim and hunter, reader and writer. The underlying surface of hexagonal tessellations expresses this effect, providing a grid of symmetry and multiplication for an infinite combination of narrative units. The larger classification of theories under the genotypical philosophical theme of conceptual and perceptual carries the idea of the human mind that tries to interpret

the totality of knowledge or all hexagons at once being confined in one hexagon at a time.

The architecture *in* the text and the architecture *of* the text

Coming to the role that architecture plays in the Library we can explain that this is a mirror we hold to the story or a thread we unwind to navigate through the identical chambers. Like Theseus who fastened Ariadne's thread at the entry of the labyrinth, Borges fastens a mirror and the description of one room at the opening paragraph. From this description the route system was extrapolated that assisted navigation into the narrative structure and the philosophical content. However, a closer look at this diagram shows an inconsistency with respect to the hexagon at the centre. As in all other galleries there should be two doorways in this space. Consequently, one of the adjacent spaces would have three openings contrary to the rule specifying two points of entry (Figure 4.10). The central hexagon poses another inconsistency apart from breaking this rule. It contradicts Pascal's *classic dictum* in the story: 'The Library is a sphere whose exact centre is in any hexagon and whose circumference is unattainable' (Borges 2000: 66). Finally, it opposes the philosophical dimensions of Borges' work that emphasizes the dialectic between openness and closure, a single interpretation and digressions into a variety of meanings. To address this inconsistency we need to look closely at the architecture of the Library and discuss its role in the fiction.

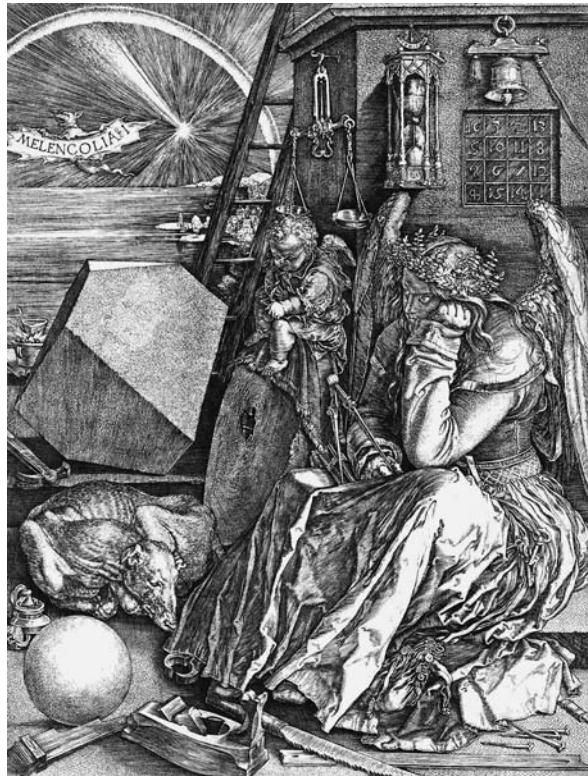
For Gene Bell-Villada the Library derives its strength from an architectural imagery based on hexagonal rooms, hallways, spiral staircases, closets and voids (1993: 121). However, its strength is not only in these symbolic images but also in spatial juxtapositions, like rigid spatial enclosure and infinite void, galleries that repeat horizontally and shafts that thrust vertically, a claustrophobic interior and a tessellated boundless sphere. From the inside the Library is incomprehensible, based on a linear route and identical galleries. But as a whole it is intelligible at an instant. In two dimensions it is experienced gradually. In the third dimension of staircases and shafts it provides glimpses to the large scale. The distinction between threading the Library and knowing it as an entire construction, between the partitioning of the plan and the unifying character of the section, is related to the ways we derive our knowledge about buildings: as sequences of spaces accessible by the senses and as frameworks connecting these sequences into larger conceptual systems.

This distinction expresses the narrative sequence and the geometrical symmetry synchronizing pairs of antithetical notions. Borges uses the ordering mechanisms of the Library's architecture to express the ordering mechanisms of the text. As in the three fictions studied previously, he points at a similarity between architecture and language based on how they structure experience. But while the settings in these fictions are not literal translations of mazes, the Library is physically modelled as a labyrinth. The system of rules that governs its writing corresponds to the system of rules that governs its space.

Based on this close correspondence between architecture and the story I can propose a solution to the question posed by the last hexagon. Borges defines four characters as the fundamental constituents of all languages in the Library:

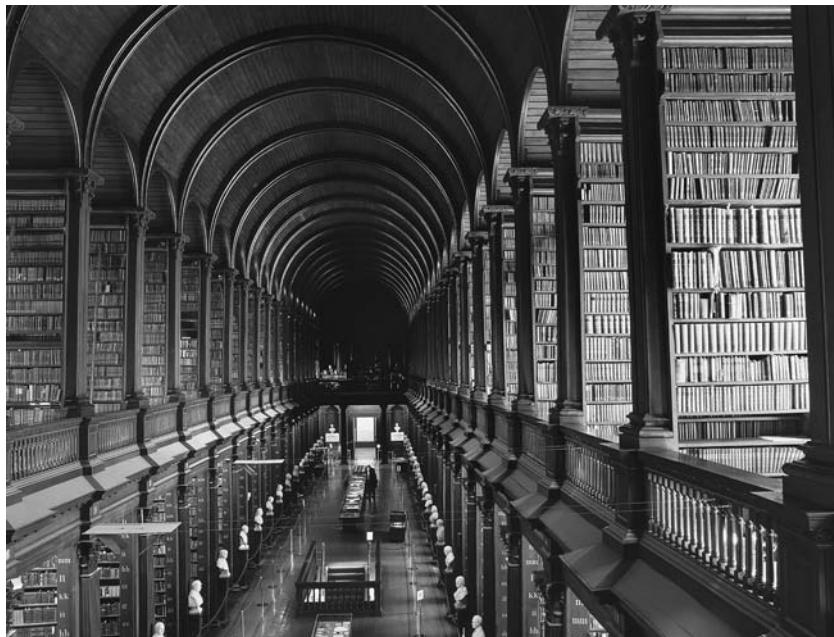
4.11

Albrecht Dürer,
Melencolia I.



letters, commas, periods and the empty space. Letters can correspond to hexagonal spaces, vestibules connecting galleries to commas, walls that separate them to periods, and finally shafts or voids to the empty spaces between letters. The dual nature of the empty space as a linguistic and architectural element suggests the possibility of a void at the centre of the Library. This element can have one doorway and satisfy the topological rules since the requirements for two openings apply only to habitable spaces.

The proposed void cuts through the centre, but is divorced from embodied experience. It corresponds to the thematic centre in paragraph eight and the librarians' search for their vindication. The conflict resulting from this search involves bodies that fall into the voids, supporting the proposition for an empty space at the place of track eight. Unlike the classical/medieval labyrinth with good or evil positioned at its core, the Library has emptiness at its centre. The route converges on a finite limit, but the discovery of the void raises again the enigma of infinite space. The mathematical philosophical and ordering systems we build help us to interpret the world and orientate ourselves inside it, but have no other meaning than guiding our navigation. But if our destiny is to wander in the labyrinth, our privilege is to apply systems of thought that make it intelligible (see Figure 4.11). Ordering architecture and narrative is one of the means by which we render the labyrinth meaningful and make it widely available (see Figure 4.12).



4.12
Dublin, Ireland,
inside Trinity
College's Old
Library.

By employing self-reference and allusions to real books the Library extends outside the limits of fiction. Using a topological and geometrical system the author identifies with the intellectual efforts of librarians to construct order out of chaos. Discovering a rigorous geometry around an empty centre, we identify with the characters threading a labyrinth, the most synchronic elements of which are the infinite voids. The Library's operations of self-reference extend to contain not only the Kabbalists, Bruno, Guldin and Lull, but also the author, the reader and those who engage with scientific, philosophical or artistic systems of thought or with the less demanding activity of analysis and interpretation. Borges suggests that it is not possible to arrive at a coherent classification of the universe or at one centre. But he points out that the impossibility of penetrating its order should not discourage us from trying to trace human designs. These designs define the components of knowledge, which he combines in the endless permutations of language but also of theoretical ideas.

Reflections of infinity

(Mystics claim that their ecstasies reveal to them a circular chamber containing an enormous circular book with a continuous spine that goes completely around the walls. But their testimony is suspect, their words obscure. That cyclical book is God) (Borges 2000c: 66).

If at the end of this analysis we are allowed to speculate on the direction of Borges' imagination we can think of his eternal traveller reaching the last space. The walls

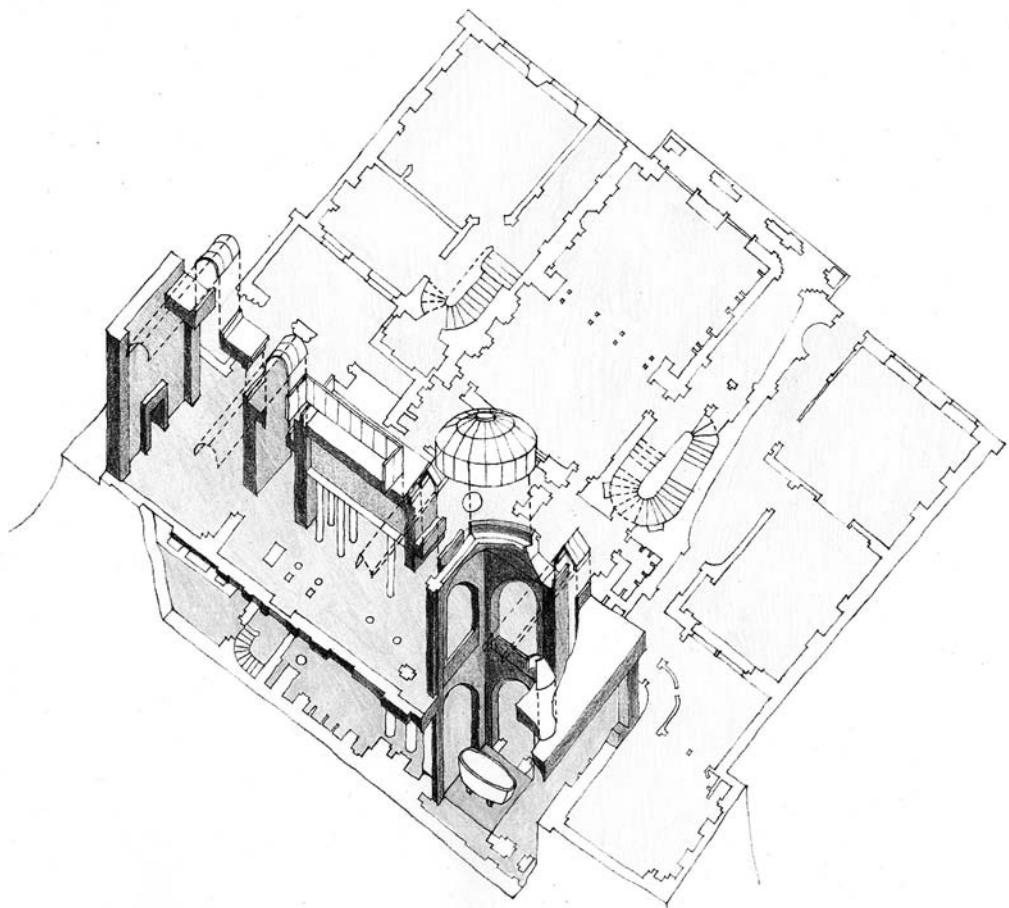
of this gallery are entirely lined up with mirrors and there is a circular balcony along the six sides. From this balcony the traveller can see the void disappearing into the distance. But he or she can also see what the entire journey could not embrace: a kaleidoscopic image fanning out into infinite space, the Library, 'total – perfect, complete and whole' (Borges 2000c: 69). The Library with its galleries and labyrinths of language is the enormous circular book, The Book, whose spine goes completely around the walls.

Conclusion

The analysis of Borges' work has larger significance than the interpretation of the individual stories or the analysis of his thinking machine taking us back to the questions raised in this book: how do we understand buildings as sets of conceptual properties and perceptual experience? The study of his work shows that this question concerns not only architecture but also language, and is variably manifested in Western systems of thought. Borges' response to this issue in all of the four fictions is to create a tension between narrative closure and potentially 'infinite' interpretations emerging from the conceptual pattern of symmetry and the pattern of geometrical tessellations. Architecture is brought into this process as a model of structural similarity highlighting the relationship between things we access gradually through our perceptions and their organization into graspable wholes.

Part Three

Spatial and Narrative Interactions



5.0
Soane's Museum,
London.

Chapter 5

Soane through the looking-glass

The house-museum of Sir John Soane

Speculate, reflect: every thinking activity implies mirrors for me. According to Plotinus, the soul is a mirror that creates material things reflecting the ideals of the higher reason ...

In a fragment of Novalis, an adept who has managed to reach the secret dwelling of Isis lifts the veil of the goddess. ... Now it seems to me that everything that surrounds me is part of me, that I have managed to become the whole, finally ...'

– Calvino, I. (1998), *If on a Winter's Night a Traveller*, London: Vintage, pp. 161, 169.

Introduction

In March 1788, after much study of Classicism, young John Soane started his grand tour to Italy. In Rome he met with Giovanni Battista Piranesi, the most significant artist in the history of etchings. Piranesi gave the young architect four of his engravings from the *Vedute di Roma*, transformations of traditional topographical views from a factual record to a vehicle for expression (Wilton-Ely 2002: 6). Soane relished these engravings among his many possessions. Hanging in his house to this day, they indicate a dual inclination, the dichotomy that emerged from the Enlightenment thinking between rationality and emotion, finding new ways of reasoning and a pre-romantic enthusiasm for the artistic imagination.¹ Nowhere else were these ideas more powerfully expressed than in the fantastic worlds of Piranesi; as to their embodiment in architecture, this was a task that Soane undertook in his house-museum (see Figure 5.1).

The museum is often seen as the work of a peculiar mind designing intricate spaces and multiplying them through optical effects. Many scholars have suggested that it incorporates Soane's interests in the notions of eternity and death, and a preoccupation with his own position in the world of architecture. But while these interests have been discussed to a great extent, less has been said about the



5.1
Soane's Museum,
London. Ground
floor plan.

spatial properties of the house and, more importantly, about those that are created through reflections. This chapter explores the spatial and optical mechanisms in the museum and the way in which they relate to the content of the displays. Like the other chapters, it branches in two directions: in the abstract space of geometrical characteristics and in that of visual relations describing the viewer's experience. The purpose is to see how Soane linked the space of the intellect with the space we occupy with our body and explore with our senses. The aim is also to understand how these two spaces are filled with his collections and reflected through mirrors expressing perhaps the way in which he wanted us to 'read' his mind in the museum.

Architect to the directors of the Bank of England, the Lord Chancellor and the Prime Minister, Soane 'had to hang his Romantic Cloak in a cupboard' (Woodward 2001: 161). His application in Neo-classicism in his public commissions indicates his search for formal perfection. But in his house – an organic ensemble of domestic architecture – his interests were expressed in ruins denoting disintegration. Piled in the shadows of the basement in the museum were tombs, urns, architectural fragments and a cloister, Monk's Yard, built as a Gothic ruin. Soane continued the eighteenth-century tradition of the picturesque, creating stage sets by assembling

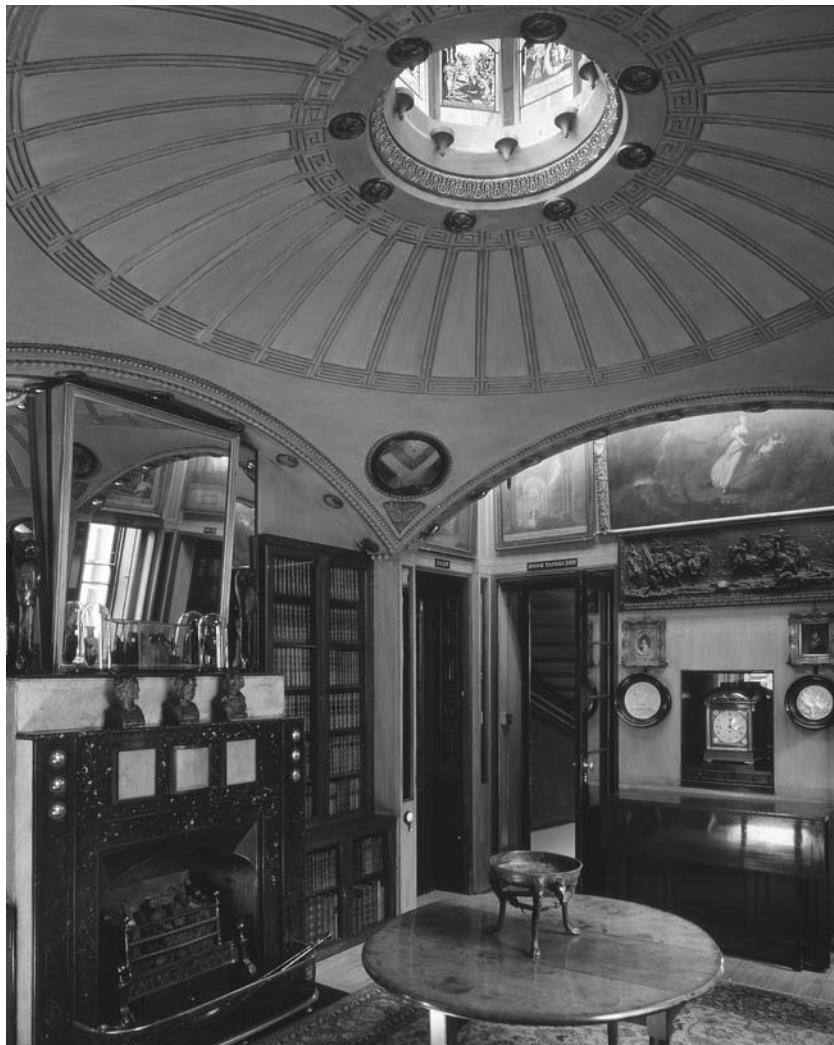
5.2

Soane's Museum,
London. Mirror.

various pieces. In Pitshanger manor, the country place he built for his family, he constructed the ruin of a colonnaded structure with an altar as in a site of a Roman temple. His fascination with decay was expressed not only in private projects but also in one of the most important of his public commissions: in 1830 he employed Joseph Gandy to paint a bird's-eye perspective view of the entire complex of the Bank of England, a cutaway axonometric that resembled a ruin. In one of his lectures at the Royal Academy he explained that if London was to be uncovered by the archaeologists of the future, the remains of the Bank would be as impressive as those of classical antiquity (2001: 165). Finally, he imagined his house-museum as an astonishing image of ruin in the *Crude Hints Towards the History of My House*.

The house, a celebration of the English interest in the classical past, was conceived as a multilayered sequence of spaces (Harbison 2000: 31). But the unexpected vistas, the optical effects and the hundreds of objects that crowd its space – works of art, books, casts, models, drawings, bronzes, stained glass, funerary urns and architectural fragments – are not arranged according to the Enlightenment principles of classification (Davies 1984: 49). Characterized by a picturesque aesthetic and an eccentric taste for narrative, Soane's displays and classical forms do not rely on rational ordering to gain appreciation.

The house was a gallery for the ideal training of young students and was intended to play an inspirational role for the architects of future generations. But, at the same time, it was an autobiographical creation that replaced a life-long dream to found a dynasty of architects. Hittorf suggested that its various spaces represented 'the particular character of the period of the art to which it belonged' (Watkin 2000: 19).² The columns formed a colonnade, medieval fragments suggested a ruined monastery, tombs were located in a catacomb, and the sarcophagus of Seti I was in



5.3
Soane's Museum,
London. Breakfast
room.

a sepulchral chamber, while the bust of Shakespeare was placed in a niche with other appropriate objects. But as though the 'speaking' function of the museum was not clear, Soane wrote and annotated three consecutive editions of the *Description of the House and the Museum*.³ He had an album made entitled *Sketches and Drawings of the Museum of J. Soane Esq.* containing 125 illustrations. Finally, he used literary strategies in *Crude Hints* to convey his ideas, like that of a future antiquarian who, coming across a ruin, wonders about the owner and the origin of the house.

The Columns describe a Colonnade of a kind almost peculiar to Convents, and as these columns are of the Ionic or feminine order it is reasonable to conclude from thence that it had been a convent of Nuns, & not a Heathen Temple. The Sphinx, The Griffon & Lamp carry us very far back

into Antiquity – & the flat vaulted Ceiling of the great Crypt in itself so truly Egyptian that –'

Crude Hints was written in August and September 1812, during which time Soane was rebuilding No. 13 Lincoln's Inn Fields, the museum portion of his house. 'While his house was a demolition site he imagined it as a future ruin, asking how it would be interpreted – as a convent, a Roman temple, a burial site, or a magician's lair'. At that time Soane was studying the 'first origins' of architecture for his Royal Academy lectures, reflected in the manuscript through various allusions to 'Semiramis, Nineveh, Egypt and Noah's Ark as well as to the Roman world'. These references meant that the house as envisaged in *Crude Hints* existed in Soane's imagination as 'a much more grandiose scheme' (Dorey 1999: 54).

Central to his influences was the Enlightenment thought stressing return to first principles and the tradition of 'architectural eloquence' in seventeenth and eighteenth-century literary theory, which had its origins in classical rhetoric (Watkin 2000: 9). David Watkin referred to the museum as a three-dimensional version of Soane's lectures at the Royal Academy (2000: 19). John Summerson suggested it demonstrated Soane's preoccupation with death (1978: 147). Susan Feinberg argued that it is a repository of other meanings such as eternity and decay, a storehouse of memory, and a demonstration of his interest in the union of architecture with the arts (1979: 107).⁴ Colin Davies considered that the museum could be best described by the single overriding theme of remembrance. 'In the idea of the museum as a memorial to himself, Soane sought to demonstrate his own participation in the continuity of tradition' (1984: 53).

These interpretations describe the expressive content of the museum and help us see one of its most crucial dimensions: expanding with the collection and the events that influenced Soane's life, the building is a record of many 'texts' – periods, styles, alterations, acquisitions, inventories, biographies, material histories and various mechanisms of representation. Soane's descriptions, manuscripts, notes, drawings, illustrations, lectures, the books he collected, those he read, and finally the wealth of criticism and interpretation he has attracted add to the immense weight of 'words' that settle on the museum.

But if Soane's purpose was to inspire future architects, we should at first try to separate the 'words' from the building. What meaning do architecture and space carry through their own mechanisms of construction? How do these mechanisms impact on the bodily and mental processes of the viewer's experience? Soane layered spaces upon spaces, and constructed vistas to manipulate perception. He dissolved the walls through mirrors to imply spatial extension. He also integrated architecture with the displays to demonstrate it is inseparable from poetry, painting and sculpture. Therefore, focusing on the building alone would give only a partial account of what he was trying to 'say' in the museum. So, the second task in this chapter is to explore how the spatial properties relate to the principles used to arrange the collection and its narrative content.

It is argued that the museum is based on the application of local rules creating a multiplicity of visual perceptions. It juxtaposes visual synchronization with

the visiting sequence, creating tensions of an experience laid out simultaneously and one that develops through time. Although rooms are designed as classical enclosures, it is their multiple visual interconnections that are emphasized through long and oblique axes of sight rather than their organization into an overall concept. Closely related to this strategy is the planning of the display. Objects are arranged to suggest historical settings, but their operation is aesthetic and fictional rather than didactic. Finally, Soane uses reflections to accentuate the multiplicity of views and the idea of the house as a realm of potentially infinite spatial relations. But the mirrors also advance an idea of his self-portrait as part of the configurational and narrative relations in the house.

The house-museum

The museum grew out of altering three terraced houses in Lincoln's Inn Fields, a residential urban square in central London (Figure 5.1). On the exterior Soane expressed the individuality of the museum segment with a loggia projecting out of the flat fronted terrace. In the interior he linked no. 13 with the rear plots of no. 12 and no. 14 through three enclosed court spaces. The front area served a more conventional domestic function, consisting of the entrance vestibule, the Library and the Dining Room on the ground floor, the Drawing Rooms and the bedrooms at the upper levels. The back areas carried the main function of the 'museum' containing the Colonnade, a domed void that overlooks the basement (the Dome), the Upper Office overlooking the Dome, and the Picture Room overlooking the Monk's Parlour and the Monk's Yard at the basement. The central courtyard is flanked by two passage rooms to the right, the Study and Dressing Rooms, and by the Breakfast Parlour to the left. The Crypt at the basement contains a Sepulchral Chamber and is reminiscent of Roman catacombs or burial chambers.

The display does not have an explicit didactic logic, while the juxtapositions of objects were intended to inspire a reaction that was analogous to reading poetry (Thornton and Dorey 1992: ix). Each object is situated in its own significance as well as in the expression it takes from its participation in the 'iconographic programme'. 'It cannot be isolated and interpreted individually, or solely on the basis of its formal iconography, but has to be placed within the context of Soane's character and vision' (Lorch 1982: 45). The best account of this vision is provided by Soane himself:

One of the objects I had in view was to show, partly by graphic illustrations, the union and close connection between Painting, Sculpture and Architecture – Music and Poetry; – another purpose is, the natural desire of leaving these works of Art subject as little as possible to the chance of their being removed from the positions relatively assigned to them; they having been arranged as studies for my own mind, and being intended similarly to benefit the Artists of future generations (Soane, *Exordium*, 1835).

Soane's interest in the union of the arts is evident in the integration of artefacts with the architecture. So, the vistas are marked with objects and the eye is led

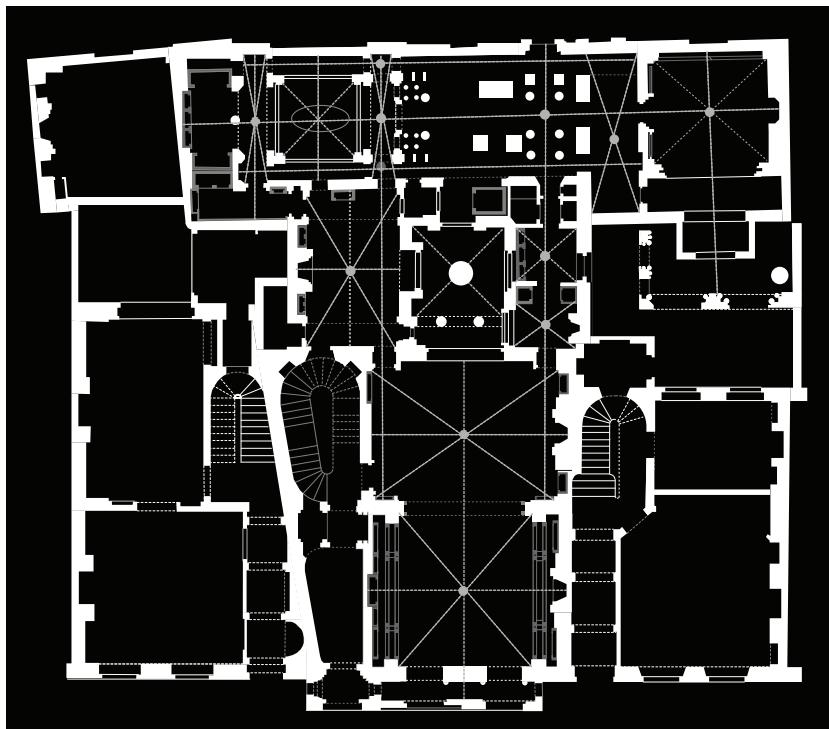
to the perimeter of the rooms dissolved through the reflections. The ceilings are varied through skylights of tinted glass, creating strong contrasts between areas of darkness and light. The chiaroscuro effects, the varied sectional treatment and the 'erosion' of the walls enhance the illusion of depth, implying that each room is part of a larger space. In the section that follows I will look at these characteristics together with the display and analyze how they are related, influencing the viewer's perception.

Geometrical and visual lines

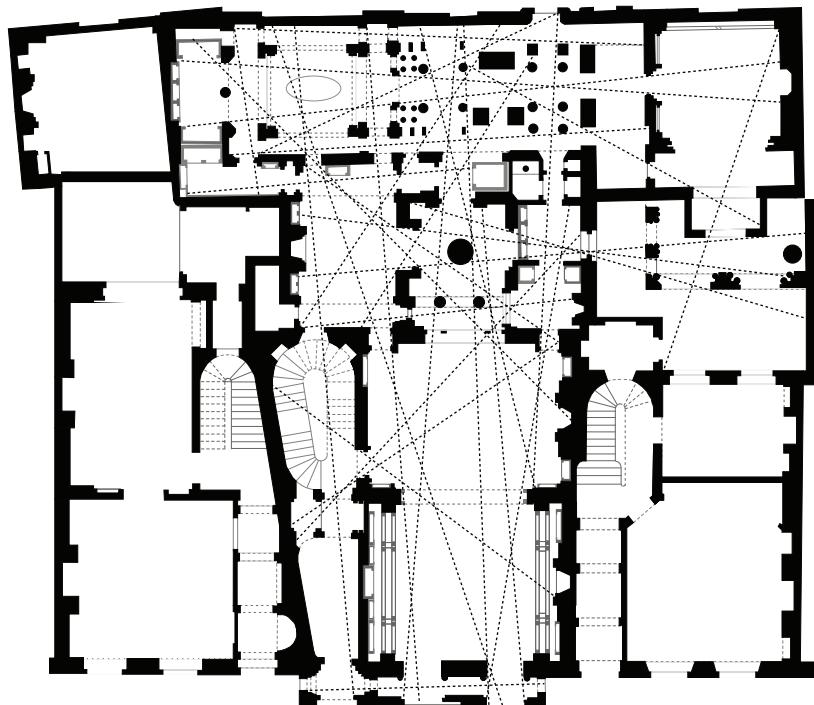
Everywhere in the museum Soane reminds the viewer of classical Italy, from the 'Loggia' at the front to the internal courtyards, the Roman themes at the Crypt and the antique fragments. Classicism is present in the Breakfast Parlour displaying prints of Villa Negroni and at the Dome displaying the statue of Apollo of Belvedere. Coming from Lord Burlington's villa at Chiswick, it was a double emblem, a demonstration of classical perfection and the English Palladian movement.⁵ The museum evokes a classical interior not only through these references, but also through the sequences of spaces arranged around a central open space. But while the Monument Court has a central location, the central axes are broken by the back wall of the Dining Room and the *Pasticcio*, a column composed as an eclectic combination of styles (see Figure 5.4).⁶ Instead of accessing and occupying the 'centre', the visitor follows a circular route around the Court. As for the overall symmetry of a classical plan, there is only a shifting geometrical matrix reconciling local symmetries at various places – like the axis running through the front two rooms, and the east to west axis traversing the Colonnade at the back of the house.

The next thing to observe is the relationship between the geometric matrix produced by joining the centres of each room with the rich matrix of visual relations captured by diagonal axes of sight (see Figure 5.5).⁷ In the classical enfilade system of rooms the geometrical axes follow the laws of central perspective and the lines of movement, so that views at each step are symmetrically framed by the physical elements of the building. In contrast, the geometrical lines linking the centres of rooms in the museum can be understood separately from the lines of visual relations. The reason is that a large number of diagonal visual links travel through the interior, establishing all possible visual connections. Some vistas are frontally disposed, but most views penetrate the spaces diagonally, freed from the laws of frontal perspective. But in spite of the multiple visual relations, the rooms are still perceived as spatial enclosures with their centres defined explicitly through their architectural and decorative treatment. So, the conceptual structure of the broken geometrical lines and the arrangement of views can be best understood as a tension between the ideal Renaissance model of axial symmetry and its visual decomposition.

Soane wanted the viewer to look at his spaces and read between the lines with Italy in mind, from the original visitor ticket saying that the museum was not open on wet days, to the skylights and tinted glass bathing the interior with 'Mediterranean' light. But the emphasis on light and the diagonal visual links are indications that the classical past provides forms and inspiration, but it is not an abstract ideal order that underlines his imagination. Evoking the senses, encouraging



5.4
Soane's Museum,
London. Ground
floor plan with
matrix of the
geometrical centres
of rooms.



5.5
Soane's Museum,
London. Ground
floor plan with
visibility lines (axial
lines).

multiple viewing positions and decomposing classical geometry, the museum recalls another important movement: the Romantic Landscape tradition.

The decompositions in the design were to a certain extent related to the constraints imposed by Georgian architecture and the incremental way in which the museum grew out of joining and reconstructing three domestic buildings. However, Soane was a neo-classical architect who was inspired by Piranesi's dramatic compositions and the Romantic movement. He experienced tensions between his interest to push the boundaries of invention towards distortion and complexity and the need for a coherent pedagogic system for his students (Wilton-Ely 2002: 54). The tensions between these two sides found expression in the creative combination of display fragments from diverse sources in the museum. But, most importantly, they were expressed through a dramatic spatial composition, balancing associations from the classical world with the Romantic tradition. So, the organic domestic buildings with their classical façades and their interior deformations were seen as means rather than ends, an opportunity for a creative synthesis of elements rather than a response to the exiting context and its limitations.

Circuit

Soane was a 'lonely student of Enlightenment thought', but also a student of the 'sensationalist and associational philosophy of the Picturesque movement. He read Burke, Kames, Payne Knight and above all Le Camus de Mézières, whose book of 1780 he translated from French under the title *The Genius of Architecture, or the Analogy of that Art with our Sensations* (Watkin 2000: 20). Watkin explains that his 'reluctance to show visitors around his house and museum on dark days not only indicates the extent to which lighting effects were integral to his architecture, but also suggests that he almost saw the building as a kind of garden' (1998: 9). The Picturesque movement marked a departure from the unity of the Renaissance composition. It removed the axis from the formal structure of the plan and connected the separate pictorial parts through a route sequence (Steenberger and Reh 1996: 46). Another characteristic was the association with the paintings of Claude Le Lorrain and Nicholas Poussin that using iconic references idealized the Roman landscape. These references formed distinct episodes, steps in the circuit translating the scenic route into a model of narrative in the garden. It is not clear whether Soane saw his museum as a metaphor for a garden. However, the long sequence in the house and the emphasis on perceptual effects carry a strong association with the Romantic tradition moving away from the overall conceptual order of the plan to rich and informal perceptual experiences.

Soane did not have a preferred route in which he wanted the public to see the house. He also avoided a historicist emphasis, mixing exhibits from diverse periods. However, in his *Description* he uses a sequence retained to this day in the numbering of spaces in the museum guide. Based on Hittorf's suggestion that the qualities of objects were used to suggest the particular period in which they belonged, like the Colonnade and the catacombs, we can think of the display as consisting of aesthetic arrangements suggestive of room-chapters. We can also think of the sequence used by Soane in his *Description* as an 'ideal route', moving

anticlockwise through these chapters from the contemporary spaces at the front – the Dining Room and the Library – to the basement containing the medieval ‘ruin’ of the Monk’s Parlour and Yard, the Roman Crypt and the Egyptian Sepulchral Chamber.⁸ The Sepulchral Chamber is placed under the void on the ground floor displaying the sarcophagus of Seti I found in the Seti burial chamber by the Egyptologist Giovanni Battista Belzoni (1817).⁹ The entire basement with its arches, plaster models and Roman urns shows Soane’s continuous fascination with ruins and the symbolism of death.¹⁰

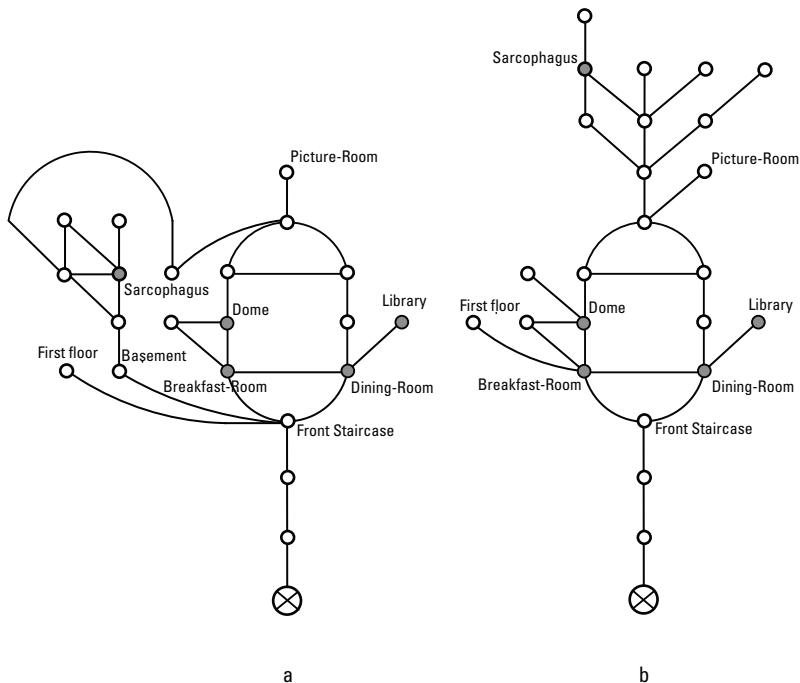
Returning to the ground floor through the back stairs, the route reaches the Dome, at the back of the museum (Figure 5.1). This area contains a dense display of objects that lead the eye to the domed skylight reflecting an uneven pattern of light and shade. The statues, vases and plaster casts that crowd this space are descriptive of many periods, but the main emphasis is on English Palladianism through Apollo, Soane’s own bust and the works of his fellow artists. The bust was sculpted by his colleague Sir Francis Chantrey and rests on a pedestal with small statues of Michelangelo and Raphael by John Flaxman on either side (Feinberg 1979: 125). These were made for the painter Sir Thomas Lawrence whose bust stood above Soane’s bust on a vertical axis. Feinberg writes that this arrangement was ‘a tribute to a distinctly British union of the artists ...’ (1979: 125). The Dome is the space where Soane’s expression of his position in the world of architecture and the arts is most clearly elaborated. It glorifies the union of painting, sculpture and architecture, but it presents architecture as ‘the pre-eminent art’. Feinberg suggests that ‘although there was no linear hierarchy among the portrait busts, it was clearly Soane, the architect, who presided’ (1979: 127).

Soane reserved the Breakfast Room for the last stages before moving in his *Description* to the top levels. Based on this description it can be suggested that he leads the reader through a circuit, firstly travelling backwards in time to the Crypt, and secondly moving forward to the front of the house in cyclical fashion.¹¹ Essential moments along this route are the Sepulchral Chamber, the Dome and the Breakfast Parlour. The first two are sectionally linked, establishing a visual connection across periods. They also integrate a diverse display based on free associations. The Breakfast Parlour takes its architectural theme from the recurring usage of vaulted ceilings by Soane and from Campanella’s coloured prints of Villa Negroni, displayed alongside the window. It has been often discussed as a distinct entity in the museum standing for Soane’s entire work, a world within the world of the house. It is, therefore, a miniature version of Soane’s *oeuvre*, linking thematically his architectural career with history, the larger narrative in the house.

Although this sequence occurs in a verbal description, its relationship with the actual paths in the museum becomes more evident when we compare how the visitors access the building with Soane’s own knowledge of his house. To make this comparison clear I diagram the spaces and their connections using a technique known as *justified graph*, with circles representing rooms and lines representing spatial connections also taking into account the spatial steps each space is situated from the outside.¹² These diagrams show that the remotest parts of the route at the basement occupy a position that in reality is much closer to the exterior than is

5.6

Soane's Museum, London. Justified graphs of spaces.
 (a) Graph illustrating the connectivity structure of the layout based on step depth from the outside.
 (b) Graph of the connectivity structure as experienced by the visitors. Note that the links between the Front Staircase and the basement has been removed to represent the way in which visitors usually experience the museum. The two graphs capture the difference between the way in which Soane 'knows' his house and the way in which it 'becomes known' to the visitor.

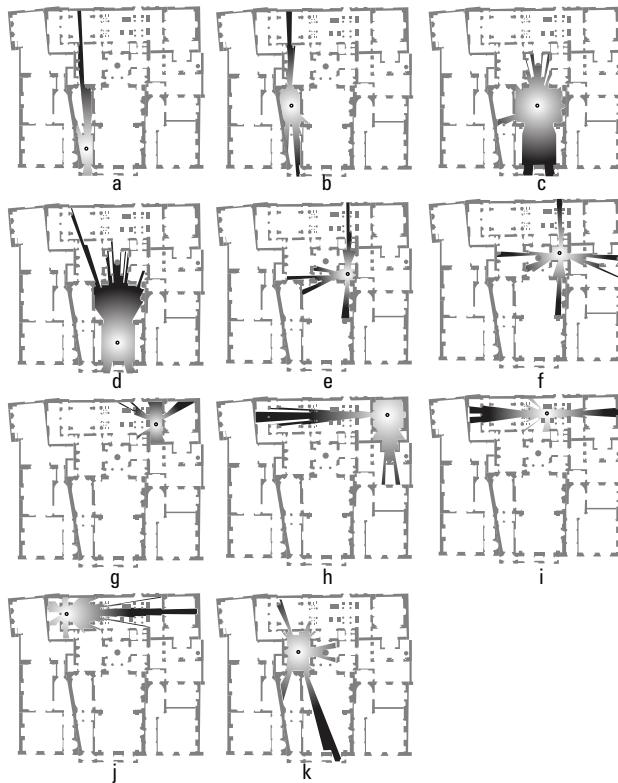


actually experienced by the viewer (see Figure 5.6a, b). The large circulation loop and a number of smaller loops in Figure 5.6a provide possibilities to approach the visit in a different order or even to omit parts of the building. However, visitors access the Crypt having first seen the ground floor spaces, rarely moving from the Stair Hall to the basement at the start of the visit (Figure 5.6b). The gap between the ways in which Soane moved in his house – his role taken later by the curators – and the ways in which it becomes known to visitors expresses the difference between the owner who knows all routes, and the way in which the sequence shapes the viewer's knowledge of the museum. As Woodward suggests, 'it is not too fanciful to imagine him concealed in the shadows and listening to the whispered speculations of visitors' (2001: 173).

As in the landscape circuit containing references to painting and literature, Soane's circuit contains references to architecture and the arts, suggesting a journey through time.¹³ The room-chapters and the path offer a visual demonstration of the history of architecture. But a second important characteristic of the English landscape tradition was the co-ordination of vistas along a route establishing a succession of visual relations. What follows is an exploration of the views offered along the path to see how Soane has planned the sequence of viewing.

Moving and viewing

On entering, the visitors see a long vista reaching the area of the Dome at the deepest parts of the interior (see Figure 5.7). A glimpse to this area is offered again from the Dining Room and the Library through a diagonal view extending to the back of



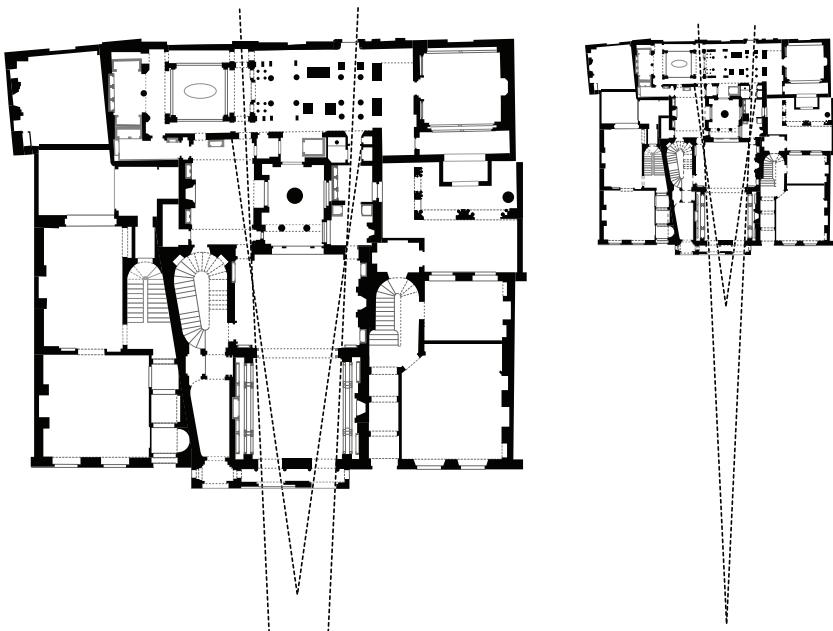
5.7
Soane's Museum, London.
(a–k) Sequence of isovists on the ground floor. The order in which the isovists are produced is based on the order which Soane used to describe these rooms in the *Description of the House and the Museum on the North side of Lincoln's Inn Fields, the residence of John Soane*.

the house. The vistas from the Study and the Dressing Room stretch narrowly from north to south but the Dome remains out of sight from these spaces. It enters the field of vision again from the Picture Gallery at the east of the Colonnade. If visitors proceed to the basement from this point, they see the Dome through the void over the sarcophagus. Returning to the ground floor they are led to the void by the long vista terminating on Apollo. Leaving the Dome to enter the Breakfast Parlour they encounter a sudden opening of the views reaching diagonally from the north-east to the south-west of the loggia and to the outside (Figure 5.7k).

Diagonal visual accents characterize the entire route, but these are the strongest of all, generously travelling through the largest rooms of the house. If we mirror the visual line linking the Colonnade at the back right side of the plan with the Library with respect to the Court, the two axes of sight meet at the Green in front of the museum (see Figure 5.8). The intersection of visual axes connecting the interior and the exterior can be compared to Kent's meeting of lines outside the Rousham garden (Steenbergen and Reh 1996: 331). With this mechanism Kent directed the focus outwards, creating a theatrical landscape and the illusion of a garden that turns to a boundless space.¹⁴ It is not suggested that Soane adopts this device from Rousham, but his interest in ruins and the idea of the garden as a space that opens to a 'labyrinthine' and 'infinite' nature would seem to have influenced his thinking.

5.8

Soane's Museum, London. Ground floor plan with visual lines meeting outside.



The house-museum is part of a larger setting, which includes the inside, the outside and with the depths of history at its core a much larger world.

Visibility

Sequencing movement and visibility Soane creates a journey through time. But the room chapters are visually interlinked rather than being isolated from each other. To describe the structure of visibility the same procedure is followed that was used in the analysis of the Barcelona Pavilion, overlaying a matrix of spatial locations on the plan and measuring the relationships of visual fields from each point to all other locations. Figure 5.9 shows that the distribution of integration, represented by light tones, permeates the deepest parts of the plan and spreads throughout the house. The measure of integration accounts for how easy it is to access visually all areas from all other areas in a layout. Its distribution in the museum shows that every part of the plan is visually 'close' to every other so that a viewer needs to change direction only a few times in order to see the entire plan. The integration diagram confirms what many authors have observed: a rich network of visibility interconnecting all areas in the house.

The Dome is one of the most visually accessible places, but it has also the highest metric distance from the outside and from all other spaces (see Figure 5.10). Through its high levels of integration it 'draws' all rooms to itself, assuming a 'central' position. Through its metric distance from everywhere else it keeps them away, securing its differentiation. Soane gave the Dome the paradoxical status of a 'remote centre', which in most religious interiors is separated from and connected to the 'secular' exterior through a direct axial connection. This area featured in all his



5.9
Soane's Museum, London. Visibility structure. The distribution of integration extends at the deepest parts of the house showing that there are strong visual interconnections among spaces. It also highlights the diagonal link between the Library at the front and the Dome at the rear of the layout.

plans for expanding the house and was the main motivation of his work from early stages.¹⁵ Its spatial properties and its thematic content show an aesthetic symbolism confirmed by Soane's special interest in this space.

The spatial construction of narrative

At this point it is essential to draw a distinction between the visiting sequence (Figure 5.7) and the visibility structure as captured by the property of integration (Figure 5.9). The former describes what one sees sequentially through spatial progression. The second captures global relations independently of the order in which spaces are visited. The study of the relationship between visibility sequence and visibility structure accounts for how seeing the house along a path relates to visual relations of each position to all others, irrespectively of the way in which viewers move along to see the layout.

The circuit directs attention towards the Dome, first by giving the viewers a distant view, and second by attracting them through a sequential discovery to this space.¹⁶ The Breakfast Room is reserved last in Soane's description of the ground floor, and is a space where he presents his own signature in the storehouse of architecture. However, the integrating capacity of the Dome is stronger than that of the Breakfast Parlour. Containing an immense diversity of objects and lit from the top, the void links with the sarcophagus and the Crypt below, connecting many

5.10

Soane's Museum, London. Diagram of maximum isovist radials.

The lightest tones represent spatial locations offering views that extend along the longest lines through the house. Note that the Library and the Dome are at the end of the longest vistas.



objects and layers of history in the house. So, it contrasts the forward direction of history with an arrangement, which is universal and synchronic. Its high degrees of visual integration and its 'sacred' location at the remotest parts of the plan indicate its aesthetic character, integrating architecture and the arts outside historical time. The wide range of objects and their surprising juxtapositions adds to this character. Soane must have seen the Dome as an expression of memory in the house, a kind of Pantheon, but also as an expression of the aesthetic quality of the work of art in the historical work of art.

It is not only the Dome that articulates a contrast between being at the deepest end and at the 'centre' of integration. The distribution of integration throughout the house and the large circuit creates a tension between seeing the collection along a path and being able to access visually each room from almost every other location. The spatial itinerary gains its significance by its contrast to an integrated interior, and the spatial sequence is understood in opposition to a condensed spatial frame. So, the architectural dimensions of Soane's narrative develop as interwoven notions of space and time, of temporal succession and spatial compression, experiencing the house in sequence and comprehending it as a whole by few changes in direction. Yet, even the sequence as a metaphor for time follows a cyclical pattern, implying that one can circulate infinitely through the museum and its contents. The circuit and the strong visual interconnections suggest that it is not

the visitors that walk in a circular route through history; it is time and history that circulate around them.

Soane has used other mechanisms to reinforce the tension between the route sequence and the synchronic nature of the visibility structure. Punctuated by a series of skylights the roof line undulates along the visitor's route. The surfaces are sculpted and encrusted by architectural elements, niches, reliefs and ornamental features. The detailed articulation of the roofline and the walls implies a further partitioning of the interior into minutely defined spaces, a potentially infinite series of spatial progression. These undulations increase the number of 'steps' one traverses in sequence while at the same time intensifying the multiplicity of visual interconnections. But the most powerful devices in accentuating the visual complexities of the interior are the mirrors. These mirrors will be discussed next in order to analyze the visual relations constructed by the reflections.

Reflections

The mirrors are placed at the periphery of the rooms, where the axes terminate, over the Library shelves, on doorways, window mullions and the frames of furniture. Vistas appear to extend, doorways seem to be open, walls to be detached from the ceiling, and windows to consist of continuous glazed surfaces instead of being divided into glass panes.¹⁷ But apart from dissolving the walls, mirrors construct a 'polyphony' of distorted perspectives, like the rhythmic stanzas of the convex miniature views in the Breakfast Room, showing that what Soane meant by the 'poetry of architecture' was a 'language' of optical effects (see Figure 5.3).

The views from this room into the monument court and into the Museum, the mirrors in the ceiling, and the looking-glasses, combined with the variety of outline and general arrangement in the design and decoration of this limited space, present a succession of those fanciful effects which constitute the poetry of architecture (Soane 1835).

The largest collection of mirrors is found in the Library, the Dining Room, and the Breakfast Parlour (see Figure 5.11). But mirrors are also used in the Corridor, the Colonnade and the Dome, like the two reflective surfaces on the diagonal sides of the piers that frame the Apollo.¹⁸ Figures 5.12a–d present the actual visual fields, drawn from the centres of the three rooms, and what is seen through the reflections. The mirrors in each room construct an illusionary expansion in many directions. The multiple views accentuate the geometrical centre of each space. But the spatial expansion implied by the cumulative effect of reflected visual fields in the three rooms emphasizes the diagonal link between the Dome and the front of the house (Figure 5.12d).

Leaving aside the emphasis placed on this link, there is a secondary emphasis on the Monument Court. Through the mirrors located between the two front openings in the Library and the mirror over the mantel in the Breakfast Room the Court is duplicated in two directions. The first effect created by this duplication is the reinforcement of the central position of this element and its axes of symmetry.

5.11

Soane's Museum, London. Ground floor plan with mirrors.



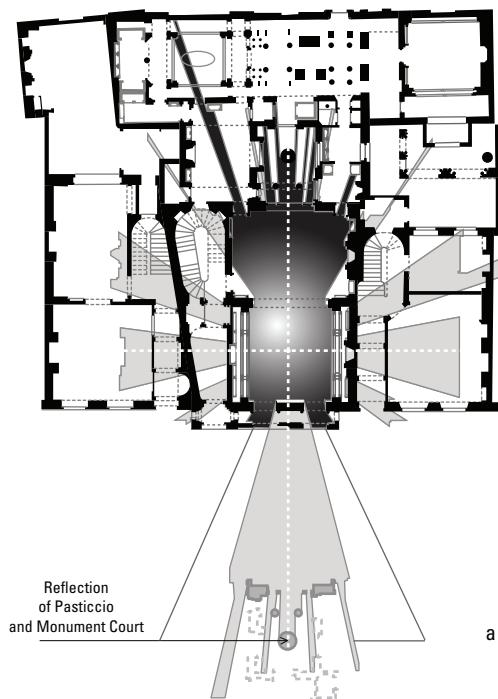
But the Monument Court is not occupiable, while the central axis is broken by the Pasticcio. The reflections of the Court bring the notion of broken symmetry to the foreground. They intensify the tension between the ideal pattern of classical symmetry and the way in which Soane decomposes this symmetry in the layout.

The second effect produced by the reflection of the Court is the impression that the portion of the front wall in the Library between the two windows is 'dissolved' opening to the outside. This is because the reflection of the exterior space of the Court seems to merge with the exterior space of the Green seen through the windows. Particularly relevant to this effect is the intersection of the visual axes at the Green, discussed earlier, pulling attention to the outside. The multiplication of spaces through reflections, the meeting of the axes of sight outside the house and the dissolution of the front wall seem to reinforce the analogy of the museum with the picturesque. Furján makes a connection of the picturesque characteristics of the house with the convex mirrors used by Soane and the 'Claude Glass', a small convex mirror carried by painters and tourists during travel to frame, edit and reconfigure the landscape. Yet, it is primarily the optical characteristics of the museum that recall the absence of boundaries in the English garden. They articulate an idea of the museum as a part of a larger world, integrating the past with contemporary time, architecture with the arts and the inside with the outside.

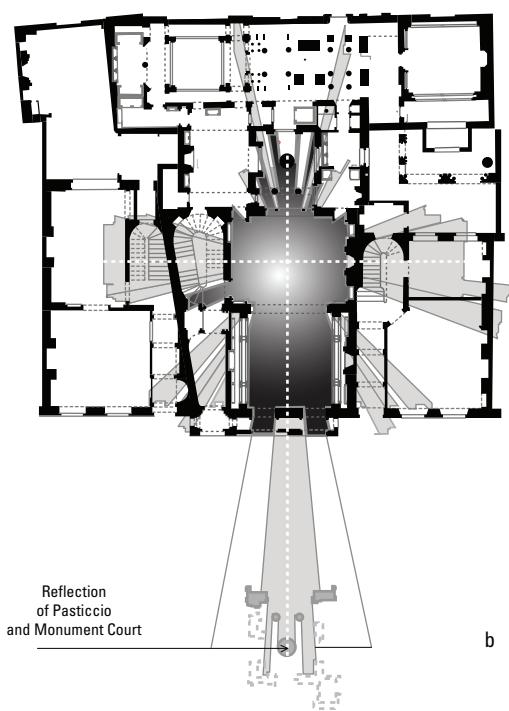
Architecture and poetry

Soane believed that architecture is a language that can produce poetic effects. But how can architecture work as poetry, being primarily a non-discursive art of spatial

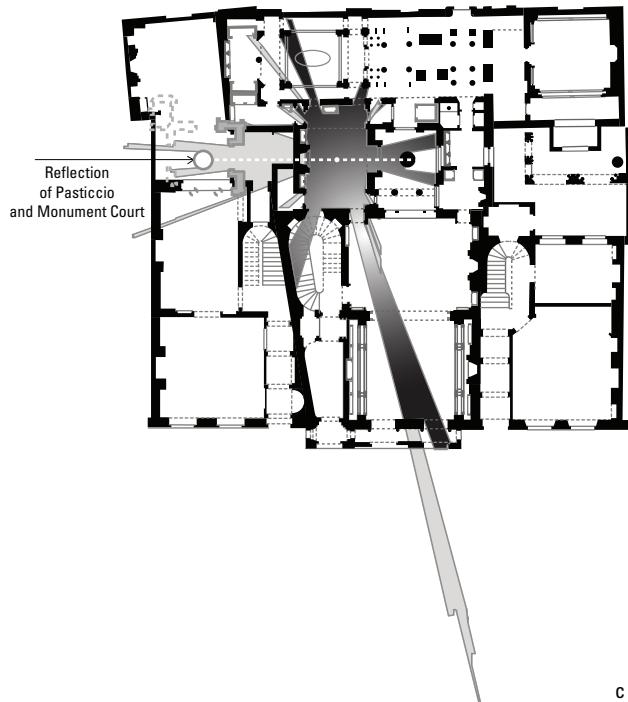
5.12
Soane's Museum,
London. Isovists
and reflected
views (light grey)
produced from:
(a) The centre of the
Library.



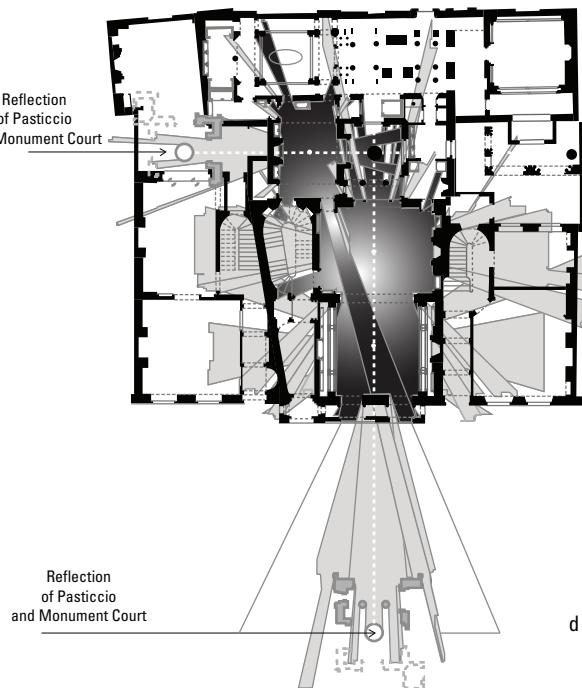
(b) Dining Room.



(c) Breakfast Room.



(d) Composite isovist from all points. Note the 'opening' of the front wall to the outside through the two windows and the reflection of the monument court on the mirror placed between them.



relations? Explaining the notion of spatial configuration Hillier uses language as an example to draw a distinction between 'discursive' and 'non-discursive' meaning. He explains that in language there are ideas we 'think of' and 'ideas we think with', that is, the meaning represented by words, and the rules of syntax and semantics, which govern how we deploy words to create meaningful sentences. 'The words we *think of* seem to us like things, and are at the level of conscious thought. The hidden structures we *think with* have the nature of configurational rules, in that they tell us how things are to be assembled, and work below the level of consciousness' (1996: 40). It may be suggested that architecture and language in the museum relate through the rules that govern the relations among spaces, the relations among objects and the relationship of space to the display. But more importantly – since it is poetry Soane is interested in, rather than everyday language – architecture and language relate in the museum through the potential of meaning found in unexpected juxtapositions or even random combinations. This argument can be pursued further, adding that the multiplication of visual relations through the reflections works like the startling combinations of words in poetry, showing unusual angles of rooms and unexpected spatial relations.

Having said this, it is worth drawing attention to the words 'North', 'South', 'East' and 'West' printed on the canopy screen hung between the two front spaces. Understood within the context of the spatial relationships in the museum these words reinforce the idea that it is a fraction of a larger universe, or a model that orders a world of geographical expansion. But Soane also creates a philosophical game, asking viewers to consider what they see in reality and what is implied through the reflections. He seems to forewarn the viewers that in a house that reproduces itself backwards they should anchor their sense of orientation on a system of cardinal points. But since the actual and the implied are blurred through looking-glasses, the words and the spaces can also switch between being real and being implicit. Like Borges, Soane blurs the difference between architecture and language, reality and representation. In the previous chapters we encountered Borges' use of mirrors as models expressing the multiplication of relations underlying his narrative strategy, as well as combinations that have not been realized but are latent in the text. The mirrors in the museum have a similar function. They make us aware of a potentially indefinite set of spatial relations and cause our attention to oscillate from the reality of visual properties to the combinatorial possibilities discovered through the reflections.

These philosophical games demonstrate Soane's belief that architecture is an intellectual art that arouses ideas in the mind. Soane often referred to the museum and the displays as 'studies of his mind' and mentioned the operations of the mind over 160 times in his lectures at the Royal Academy (Watkin 2000: 9). The museum has been often seen as a mirror of Soane's thinking faculty, or a reflection of his mind. The common etymological root of '*speculum*' and '*speculare*' (mirror – to speculate, to think) suggests a link between the reflective surface and the thinking activity.¹⁹ However, since it is not only the representational function of the mirror Soane is interested in, but also its poetic operation as a field of possible meanings, a twist in this argument can be proposed; the relationship between the mirror and

the mind is found in the capacity of the latter to think through combinatorial relations – which are present or latent in space – and the capacity of the former to multiply the combinatorial potential through the reflections. However, Soane's belief that buildings should not be void of semantic content is a crucial factor in understanding the relationship between his mind and the reflections. In the section that follows I discuss this relationship further and discuss the museum as a self-portrait. This discussion can help test the hypothesis formulated above regarding the ways in which the mirror, architecture and ideas for Soane interact through the thinking activity.

Soane through the looking-glass

Influenced by Le Camus, Soane claimed that 'architecture speaks a language of its own, and above all a building, like a historical picture, must tell its own tale' (Watkin 1998: 9). Le Camus believed that the characterization of space should represent the owner's personal story. This story served as a basis for the architectural programme, with every room articulating a part of a narrative (Pelletier 2006: 22). These beliefs and Soane's bust in the Dome have often led scholars to suggest that the museum is a self-portrait. Is it possible then that mirrors advance a way in which Soane wants us to interpret his presence in the museum?

The house grew out of a lifelong expectation to found a dynasty of



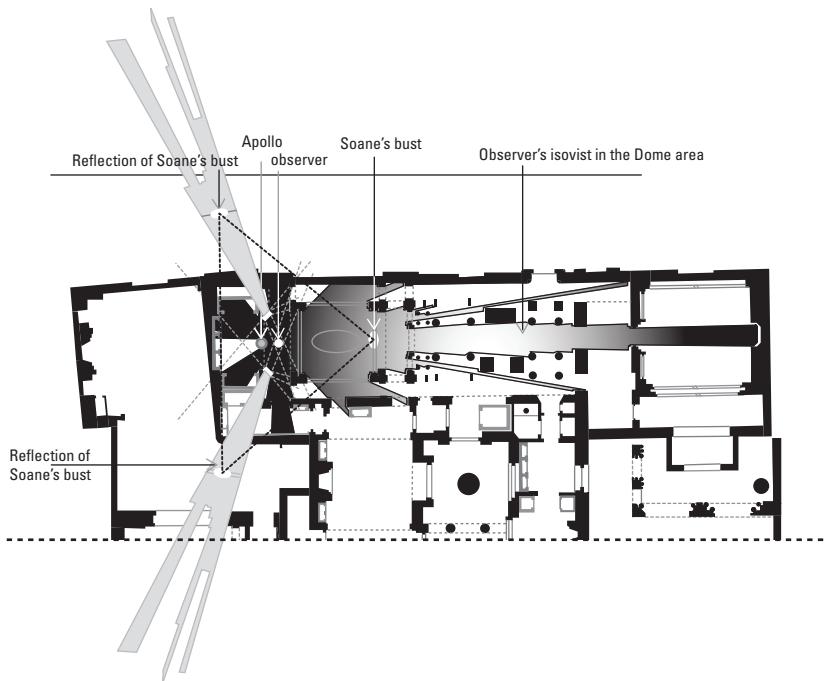
5.13
Soane's Museum,
London. Dome area.

architects that became gradually shattered.²⁰ Aged 80 and after a series of sad events in his life Soane gave his house and his collection to the government. As soon as the Act of Parliament was enforced he placed the marble bust of himself in the Dome joining the compendium of architecture and the arts in his quest for immortality. There are few other instances of self-representation, like his portrait above the mantel in the Dining Room, and the fictional retreat of 'padre Giovani', a memorial of himself, in the Monk's Parlour.²¹ Woodward suggests that the bust gives 'an irresistible impression of imminent ruin' (2001: 175). The Monk's Yard is also constructed as ruin, while his paint portrait is reproduced into infinitely shattered images through facing mirrors.²² If the house is a self-portrait the fragments in Soane's portraiture might express, as Woodward suggests, a broken dream carrying the meanings of fragility and decay.

Evans explains that 'reflections can destroy coherence, but they can also reveal it', like Dubreuil's prismatic mirrors transforming distortions into recognizable images (1997: 262). He makes another crucial observation:

the expressing function of the fragment is elusive. If the emphasis is placed on the larger whole it comes from, it signifies wholeness by external association or by self-similarity resembling the whole. If the emphasis is placed on fracturing, it ends up as fragmentation (1995: 59).

Soane places emphasis on neither fragment nor whole but on their creative tension. Through the spatial properties of the house he juxtaposes the route sequence with



5.14
Soane's Museum, London. Reflections in the Dome area. Soane's bust is reflected on the two mirrors located on the piers that frame the statue of Apollo. The bust and its two reflections create a triangle with Soane's image at the corners and Apollo at the centre.

a spatially integrated interior. Through the geometrical properties he opposes the equilibrium of one centre, the central court, with the dynamism of multiple centres. Through the organization of the display, he opposes the idea of history based on distinct room chapters with the annihilation of history based on the aesthetic juxtapositions of objects. As to the use of mirrors he contrasts the fragmentation of space through a multitude of reflections with the idea of space as a realm of all possible combinations. The role of mirrors in constructing a portrait might advance then an idea of him not as imminent ruin but as a 'dream' poignantly balanced between being broken and reaching completion.

Let us consider for example the facing mirrors placed on opposite walls in the Dining Room, one framing Soane's portrait on the right and the other the painting on the opposite side. According to Evans they might be interpreted either way: as shattering Soane's image or as strengthening it by extending it to infinity. Both effects can be the outcome of customary decorum in which portraits were surrounded by mirrors. But if these mirrors are ambiguous in terms of Soane's intentions, we should look at the two understated mirrors on the piers framing Apollo in the Dome. What makes these two surfaces intriguing is the fact that they are discreet, lost in the complexity of the display and in the tightness of the passages around the void. If Soane calculated everything according to a study of his mind he must have had a clear reason for using these mirrors.

Feinberg argues that Soane's bust is part of a theatrical stage. The antique statue, his person, and the works made by his fellow artists compose a union of the arts with architecture. But the main actors are Soane and Apollo facing each other on this stage (see Figure 5.13). Soane inhabits not only the Pantheon-Dome – a temple dedicated to all gods – but also one devoted to Apollo, a sign of perfection.²³ However, the architect's dialogue with the statue is not 'perfect' or 'complete' unless we look at the reflections. The two mirrors reflect Soane's bust in two diagonal directions (see Figure 5.14). The bust and the reflected images produce a triangle centred on Apollo. Carefully understating the two strips of looking-glass, Soane has entered a world where he can reach wholeness and completion.

The presence of the mirrors in the Dome and the reflections of Soane's bust have not been discussed before, partly because these mirrors are not prominent, and partly because the two reflected images can be simultaneously seen only from the narrow space in front of the statue and from a single position. However, each of them appears separately and emphatically in the visual fields from the passages next to the void. We can see other reflections of the bust like those on the clear glass of the doors connecting the Dome with the Breakfast Parlour. Such devices draw the viewer's attention to the architect and the collector as one moves between Soane's own *oeuvre* in the Breakfast Room and the universal *oeuvre* in the Dome.

Soane gave all of himself to the house and to its fragments, but it is by assembling them that he could achieve completion. For the Greeks, who worshipped Apollo, there was a paradox in completion. Calasso explains that its basis can be found in the Greek language itself: '*telos*, the Greek word par excellence, means at once perfection, completion, and death' (1994: 160). Soane's own fascination with death and his reflected images suggest that 'if happiness is a quality that sums up

the whole man, then it must wait until a man's life is complete in death'.²⁴ Lost in the density of the collection the two surfaces of looking-glass ensure that he would never be one of the fragments of the past whose meaning and origin no one could ever remember.

Soane's quest for immortality is expressed through another myth evoked in the Crypt and the sarcophagus. The sarcophagus, Lorch suggests, evokes the story of Osiris whose body was torn in pieces by Seth, his brother. Osiris' fragments were reassembled by Isis, after which he was revived into consciousness and knowledge.

The interdependence between the living and the dead in the Osirian myth is an eloquent summation of the problem of history and the formulation of knowledge. The past is the source of power for the present. The present depends on the past for the mythic which is often constituted into tradition (Lorch 1982: 48).

The spatial relations and the multiplicity of associations in the collection propose that Soane develops not an encyclopaedic view of history based on rational ordering, but all aspects of history – factual, dreamed, imagined and desired – through the artistic and fictional arrangements in the house. The house-museum is a universal play of combinations and a place that holds all places, a compendium of all times. Its creation is like the fundamental act of myth, establishing in its multiple variations an invariable relation between natural and cultural conditions. Nature undermines Soane's place in history by the limitations of death and sequential time. But culture can reinstate his presence through architecture, art and myth, the frameworks of all-inclusive time.

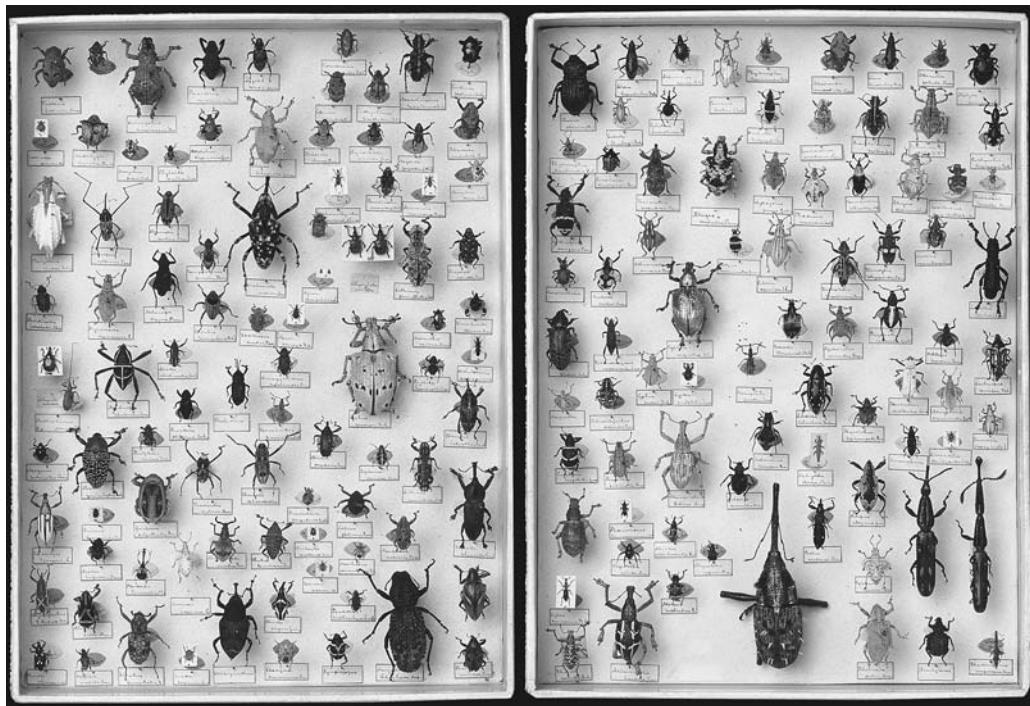
The mirror and the mind

We can now return to Soane's belief that architecture evokes ideas in the mind and examine the questions raised by his proposition: how are ideas formed or, more precisely, how do ideas travel from architecture and the physical world to the mind? Are ideas mental constructs, or are they found in the actual world of appearances? And what is the role that mirrors in the museum play in this relationship? Hillier's proposition that meaning derives from the unconscious level of rules we use in concrete cultural systems points to the fact that neither ideas nor this world belong in separate domains but they intertwine. Our capacity to read configurational properties and embed them into new realities is what links ideas and the world creating meaning. The properties observed are embedded in the characteristics of the setting. The rules we *think with*, raised to a conscious level through analysis, inform the way in which they become intelligible. It is nevertheless important not to underestimate Soane's interest in architecture as carrying semantic content, expressing ideas outside its own system of relations. Yet, the way in which semantic expression becomes rich in the museum is through the pattern of visual interconnections and the set of free associations that govern the arrangement of objects generating the potential for multiple meanings.

Looking finally at the role of mirrors, it seems that these are devices that enable us to discover hidden properties as in the triangular relationship of Soane's bust to Apollo or, more importantly, the multiplication of visual connections seen through reflections in other parts of the building. The significance of mirrors in the museum, therefore, is in their capacity to reveal the syntactic and semantic relations as the lawful instruments of thought and their poetic potential, or the *hidden unconscious* link between the world and the mind.

Conclusion

Through Soane's deployment of Neo-classicism and Romanticism the discussion of the conceptual and perceptual can be located in a historical context of architectural movements, showing his preoccupation with the creative tension between conceptual unity and the sequential nature of sensual experience. The study of Borges also identified architectural examples used in his fictions where one can observe similar tensions, but the discussion of the museum allowed a focused investigation of their realization in space. The contrast between the symmetrical design of individual rooms and the overall asymmetrical arrangement, the circuit and the high levels of visual interconnections, shows that Soane foregrounds the creative tension between conceptual unity and perceptual variation. The organization of the display follows a similar logic. It evokes a historical sequence but avoids historical taxonomy, using a-historic groupings of objects. In this way, the power of space to generate multiple relations is combined with the potential of these groupings to release multiple possibilities for interpretation.



6.0
Natural History
Museum, London,
Weevils Collection.

Chapter 6

Victorian knowledge

The Natural History Museum, London and the Art Gallery and Museum, Kelvingrove, Glasgow

The cabinet of natural history is to be in the form of a fine gallery; one might wish to have light from above, or at least from above the cases, which would line the walls around. Each case may be given the kind of ornament that is appropriate to the objects it contains, although all of them will be equal in the masses and in the sizes of their compartments, for fear of destroying the symmetry. But this means, the contents of each will be known at first sight.

— Le Camus de Mézières, N. (1992) *The Genius of Architecture; Or the Analogy of their Art with our Sensations*, trans. D. Britt, Santa Monica: The Getty Centre, p. 135.

Introduction

The Soane's Museum had no didactic function using architecture and the display to create effects and evoke associations. But by the end of the eighteenth century museums were influenced by the Enlightenment principles of classification in contrast to the 'supposedly disorderly "curiosity cabinets" of the Renaissance and Baroque Europe' (Yanni 1999: 3). Classification – a logical system of arranging knowledge based on scientific experiment and observation – found the strongest application in museums of science and natural history (Bennett 1995: 2).¹ Taxonomy was at the core of their practices, shaping the arrangement of their spaces and their collections. In this chapter I look at two Victorian museums from the late nineteenth century, each of which was based on a different approach to collecting and exhibiting: the Natural History Museum in London and the Art Gallery and Museum, Kelvingrove, Glasgow (see Figures 6.1, 6.2). Both museums are internationally renowned and are landmarks in their own cities. The Natural History Museum was shaped by Richard Owen's vision for a taxonomic display that would contain the imperial collection and show the diversity of creation. The Kelvingrove, on the other hand, approached the study of nature as part of a national agenda that extended from natural history to technology, and from industrial to decorative and fine arts. In this study I examine

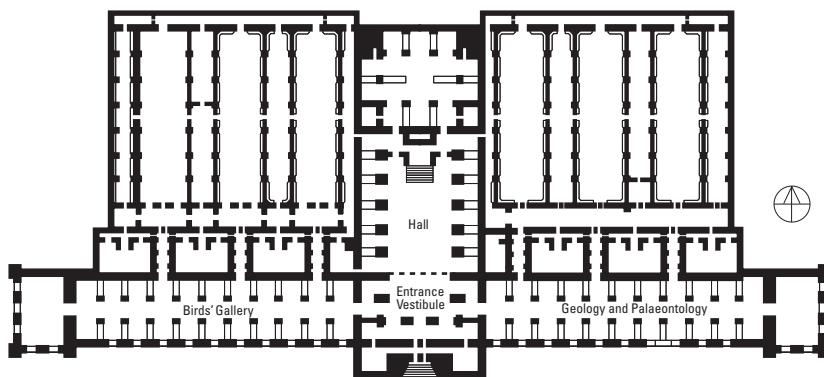
the similarities and differences between the two buildings, focusing on the ways in which the organization of their spaces relates to the display of knowledge.

Museums and knowledge

Most scientific knowledge in the late eighteenth century was produced through collections. Objects were brought to the museum, studied and classified, 'their significance and place in the order of things fixed and elaborated' (Forgan 1999: 190). But apart from developing the disciplines through the classification of objects museums were framing these disciplines through the buildings themselves. The library became a usual metaphor for museums that were often designed to include reading rooms and lecture theatres. The 'epistemological totality' of the library expressed the belief that it contained the sum of current knowledge, housing complete collections that could be 'read' like a book or an encyclopaedia (Marcus 1993: 172, Forgan 1999: 192).

The museum was a text, in both a literal and a metaphorical sense. The committee's reports [the British Association committee] used the language of books throughout to explain and press home points about the proper use of display. For example, upright, hinged glazed cases were described 'as being movable like the leaves of a book', or, with reference to good labelling practice, 'A museum without labels is like an index torn out of a book; it may be assuming, but it teaches very little' (Forgan 1999: 192).

According to Yates, space and language became interchangeable since the Greek and Roman periods through various attempts to construct and memorize the encyclopaedia of knowledge. But in the seventeenth century there was a shift from reflecting the world in memory to 'investigating the encyclopaedia and the world with the object of discovering new knowledge' (2001: 355). A key figure in this shift was Leibniz, who attempted to construct a universal encyclopaedia bringing together all the arts and sciences with the aid of a universal, infinitesimal calculus (368). Leibniz developed a library classification system to address the multidimensional



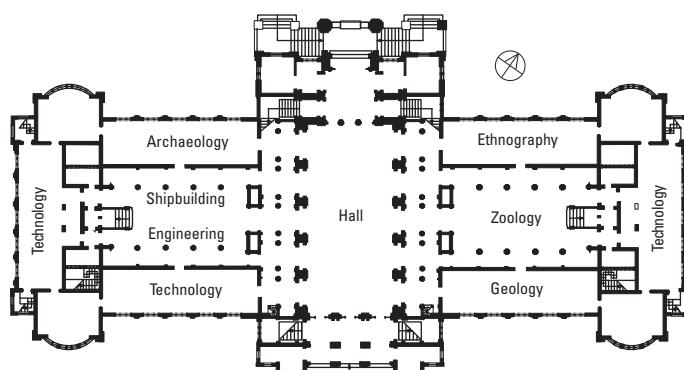
6.1
Natural History
Museum, London.
Ground floor plan.

relations among books and overcome linearity through an alphabetical index (Marcus 1993: 174).

Architecture and knowledge fitted within another metaphor used frequently, the Book of Nature, 'which itself was a reference to that ultimate "book", the divinely created universe' (Forgan 1999: 192). It was suggested on various occasions that 'each book is at the tip of a branch that grows out of an evolutionary trunk. Starting at the tips of the branches and travelling back into increasingly higher-level categories is to travel along the tree towards its roots' (Marcus 1993: 173). So, the library and the museum posed from early days the question of the relationship between epistemology, spatial organization and language. One of the purposes in this chapter is to see how the production of knowledge was mediated by space and how language contributed to this mediation.

Museums, education and the creation of spectacle

Apart from facilitating scholarly research, museums were also participating in the construction of 'appropriate' social behaviour. Their layout was influenced by the layout of libraries, but was also symptomatic of building types that emerged in the nineteenth century like shopping arcades, department stores, amusement parks, dioramas and panoramas, travelling fairs and international exhibitions. Bennett explains that exhibitions and department stores formed the medium of entertainment and public edification. As such they had an impact on museums, 'which served as linked sites for the development and circulation of new disciplines (history, biology, art history, anthropology) and their discursive formations (the past, evolution, aesthetics, man) as well as for the development of new technologies of vision' (1995: 59). The interrelated influences among museums and department stores generated a debate about the museum as a place for science and as a place for large-scale education leading to the consumption of knowledge (Yanni 1999: 151).² Victorian scientists, museum officials, architects and the public debated the role of museums, their form, purpose and the ways in which they transmitted their intended message. As Yanni explains, the scope of architecture was often criticized in their discussions as creating spectacular spaces that compromised the scientific ideals with buildings that looked like those built for the expositions. The second aim in this chapter is



6.2
Art Gallery
and Museum,
Kelvingrove,
Glasgow. Ground
floor plan.

to explore how the two museums entered the construction of spectacle, supporting the confrontation of science with aesthetic enjoyment, and the construction of knowledge with symbolic expression.

Contemporary transformations

Since their first years of opening the Natural History Museum and the Kelvingrove have experienced a strong tension between a monumental historical fabric, the expansion of the collections and a growing need to become widely accessible. They were also affected by changes in the scientific, curatorial and social perspectives underlying the organization and transmission of knowledge. Our last aim in this study is to see how the architecture of the two buildings and their current layout relate to their original and to the contemporary approach to exhibitions. This investigation will provide an insight into the changes characterizing museums and the relationship between the conceptual characteristics, the characteristics of the viewers' perception and the display. It will also offer an opportunity to address the social dimension of these buildings, how they work as spaces of social encounter, and how the spatial arrangement and the display are experienced by visitors.

It is argued that the two buildings are based on two different approaches to the study of nature. The Natural History Museum uses architecture to express a hierarchical model of knowledge based on the notion of classification. In contrast, the Kelvingrove encourages multiple links among spaces and fluid categories of knowledge. Finally, it is suggested that the difference between the morphological characteristics of the two museums is captured by a difference between the way in which the visitors access their spaces and the exhibition content.

Historical background

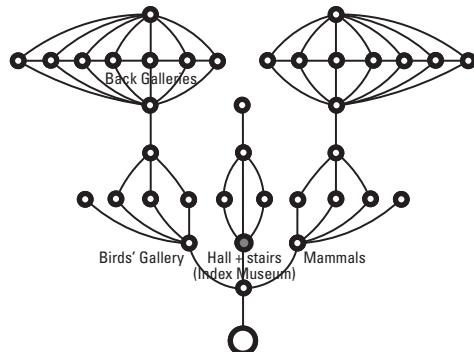
The Natural History Museum was built in South Kensington next to the Victoria and Albert Museum and close to the central walk of the Royal Horticultural Society's garden and the Royal Albert Hall.³ The Kelvingrove Museum was also part of a larger setting located in Glasgow's Kelvingrove Park together with the University and other cultural buildings. The close proximity of the two institutions with other educational sites was a result of an attempt to bring together museums and universities for the production of knowledge and the promotion of social order. Another reason was the desire to reinforce technical education as a prerequisite of industrial progress, which became the subject of great exhibitions.⁴ The Natural History Museum and the Kelvingrove were both funded by international exhibitions (Forgan 1994: 146). However, the removal of the natural history collection from the British Museum to the Natural History Museum showed a final fracture between arts and science. In addition, the ambitions that sprang from Crystal Palace to raise applied art and design to museum status became eventually diluted, leading to two independent museums in South Kensington (Marcus 1993: 199). In the Kelvingrove, on the other hand, the intention to bring a mixed display of art, history and science under one roof was eventually sustained.

The two buildings are examples of late Victorian architecture and among the most visited museums in Britain.⁵ Both are associated with Alfred Waterhouse

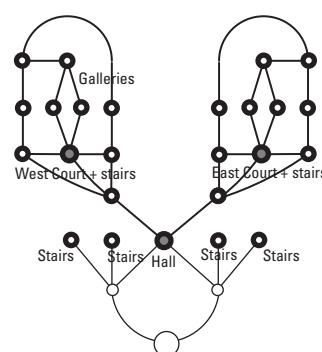
who produced the final design for the Natural History Museum, and was involved in the selection of a winning scheme for the Kelvingrove. The history of the Natural History Museum has been reported extensively elsewhere and there is no reason to discuss it at length (Peponis and Hedin 1982, Forgan 1994, Yanni 1999, Girouard 2002). However, it is important to explain that it is inseparable from Richard Owen, a comparative anatomist and palaeontologist who was its first director. Previously superintendent of the Natural History Departments of the British Museum, Owen was responsible for the establishment of the Natural History Museum and the removal of the collection to the new building. He saw the museum as a place of research as well as of education for the public.⁶ Its second purpose was to celebrate a colonial nation offering a large-scale microcosm of creation.

Owen sketched his first idea for the museum in 1859. The new building was to be symmetrical with a central rotunda that would contain two collections. One 'would constitute an epitome of natural history', what would later become known as the 'Index Museum', offering an introduction to each branch of natural knowledge. The other would illustrate the Natural History of the British Isles (Girouard 2002: 12). Behind the rotunda was to be a lecture theatre, so that exhibition and education could be juxtaposed as 'two ways of producing knowledge' (Marcus 1993: 197). The rotunda gave access to two long transverse galleries for birds on one side and mammals on the other. They in turn led to seven long galleries each perpendicular to the façade for individual collections. The architectural competition was won by a monumental design (1864) by Sir Francis Fowke, an army engineer who had designed the Edinburgh Museum of Science and Art, and the 1862 Exhibition Building in London. After Fowke's death the building was completed by Alfred Waterhouse.⁷ Waterhouse's scheme responded to the initial ideas, but with certain differences: first, the replacement of the central rotunda with a rectangular hall in the manner of a cathedral nave with 'side chapels'; second, the abolishment of the lecture theatre; third, the use of alternating wide and narrow galleries; and, finally, the change from Renaissance to German Romanesque style. The change of style allowed terracotta covering over the ironwork of the entire building, ornamented with living and extinct animals.⁸ 'The ornament was divided into two main classes: the west, zoological, half was decorated with living, the east geological half with extinct species' (Girouard 2002: 57).⁹

The Kelvingrove Museum has its origin in Archibald McLellan, a Town Councillor and Magistrate of Glasgow who in 1853 donated his collection of art works to the city for the 'education and refinement of all classes'.¹⁰ A small museum, the City Industrial Museum known as Kelvingrove House, was acquired in 1870 to house objects of a historical and scientific nature. In 1876 a wing was added to display technological items, but a larger building was needed to bring the entire display under a single roof.¹¹ The building was financed by the great international exhibition of 1888 and became an integral part of the international exhibition of 1901, with the view that a second financial success would add to the resources of the institution (Paton 1911: ix). When the Exhibition was over the new museum housed the collection from the McLellan galleries and from the Kelvingrove House. James Paton, the first superintendent of the museum, was largely responsible for its brief. He set out the



Natural History Museum



Art Gallery and Museum, Kelvingrove

requirements for a central hall intended for musical events and giving access to all parts of the building including a set of top-lit galleries. Alfred Waterhouse was the competition juror, declaring John Simpson and Milner Allen of London to be the winners in 1882, one year after the opening of the Natural History Museum.

The collections were classified under fine arts, industrial arts and natural history. Fine arts were placed on the upper level. On the ground floor was natural history in the east wing, technology and archaeology in the west wing and sculpture in the central space. The technological collections included raw products of commerce (mineral, animal, vegetable), manufacturing processes and products and mechanical works (engineering, shipbuilding and architecture). The archaeological collections comprised General Archaeology, Local Antiquities and Memorials of Glasgow. The collection of the Geological department came in 1896 when the grand collection of rocks, minerals and fossils was purchased. In keeping with the prevalent idea of the time that a museum was a glorified textbook, everything was on display. The mammal collection was systematically arranged in the east court. Birds and British fish, reptiles and amphibians completed the collection of the vertebrates. There was also a collection of invertebrates and a section descriptive of botany. The classification of the works in the picture galleries was divided into Early Pictures and Modern Works, while the balconies of the upper floor around the Hall exhibited carvings, pottery, glass and textiles. As with the Natural History Museum the Kelvingrove was ornamented, expressing the diverse nature of its displays. On the piers between the windows were festooned panels bearing the names of painters, sculptors and architects. Above the windows were elaborate coats of arms, for all the Scottish counties, and around the internal courts were panels, for the various trades of Glasgow, and for the names of men of all counties eminent in music, history, science and industry.

6.3
 Justified graphs,
 (a) Natural History
 Museum, London.
 (b) Kelvingrove.

Building layout

Geometry and route structure

The original layout of the two buildings was symptomatic of a contemporary image of a museum based on symmetry with a central hall and grand stairs. But in spite of sharing a conventional geometry, they had strong spatial differences. Waterhouse's scheme was symmetrical along the axis of entry that led to a rectangular hall with a set of galleries positioned perpendicular to Cromwell Road like the teeth of a comb (see Figure 6.1). The Kelvingrove Museum was symmetrical along two directions, with the main Hall located on the north-south axis, and two double storey subsidiary halls – the *East* and *West Courts* – placed along the east-west axis (see Figure 6.2). The former had a clear distinction between the front and the back sides, addressing the road at the front through its public entrance and elevation. The latter had a front and a back face but in reality could be accessed through both entrances from the park.¹² The Natural History Museum with its top-lit central nave with chapels evoked an ecclesiastical building. The Kelvingrove with its hall and subsidiary courts surrounded by interconnected galleries was modelled like a Renaissance palace. The former articulated a message of the cathedral of nature. The latter advanced the idea of the palace of culture. It is suggested here that the contrast between a religious and a secular character is a wider characteristic that pervades all other aspects of the two buildings.

The structure of movement in the Natural History Museum was highly hierarchical with the entrance space leading to the two front galleries, which in turn led to the rear gallery spaces. These galleries were interconnected, making it possible to visit each one from the others, without having to retrace one's steps to the centre of the museum. However, the communication between the east and the west wings was controlled by the front spaces. By contrast, the galleries in the Kelvingrove were all linked through rings of circulation that passed through the central hall. The differences in the route structure of the two buildings can be demonstrated in Figure 6.3. The graphs show that movement in the Natural History Museum was organized in sequence from the spine to the ribs, from the large to the small, from the centre to the sides, and from the front to the back of the building. In this way, the steps of the visitor repeated the logical 'taxonomic' order of the form of the building. In contrast, the matrix of interconnected gallery spaces in the Kelvingrove meant that visitors could circulate in the galleries without the need to traverse intervening layers of space.

Another important difference between the two museums was the position of the hall in the structure of circulation. In the Natural History Museum the hall lay outside the route sequence from the entrance to the ground floor galleries. One could access these galleries through the front vestibule leading to the long galleries parallel to the front elevation. In contrast, in the Kelvingrove the hall controlled access to the exhibition spaces. Owen's intention for the hall was to provide an introduction to the study of nature through the exhibition of typical specimens, and the offering of lectures. It would also serve as a synopsis of the entire collection for those who did not have time or the knowledge to appreciate the extensive collections. The hall was

intended to be educational, but its position in the route system reveals that it was primarily ideological lying outside the itinerary that led to the majority of the displays. The hall in the Kelvingrove had also a multifunctional purpose accommodating sculpture exhibitions and concerts. But in contrast to Owen's hall, it was an integral part of the route system and the educational experience.

Further differences between the two museums are revealed if we look at the vertical circulation. The Natural History Museum had single stairs placed at the end of the central axis (Figure 6.1). The Kelvingrove had six staircases, one in each of the two Courts, and two pairs of stairs each placed next to one of the two entries (Figure 6.2). The staircase in the Waterhouse building started at the end of the hall leading to the triforium galleries on the first floor level. To access the second floor one would walk along these galleries towards the south side and take another set of stairs to a bridge spanning over the entrance. From this bridge a final flight reaches a large landing at the top level offering panoramic views of the hall and the galleries on either side (see Figure 6.4). Movement in the museum was designed as a long promenade where the visitors would access the end of the hall and then move in the opposite direction, twice measuring with their steps the width of the building. In contrast, the Kelvingrove offered six options to reach the top level. It was possible to climb to the first floor skipping the hall and the ground floor galleries.



6.4
Natural History
Museum, London,
Central Hall.

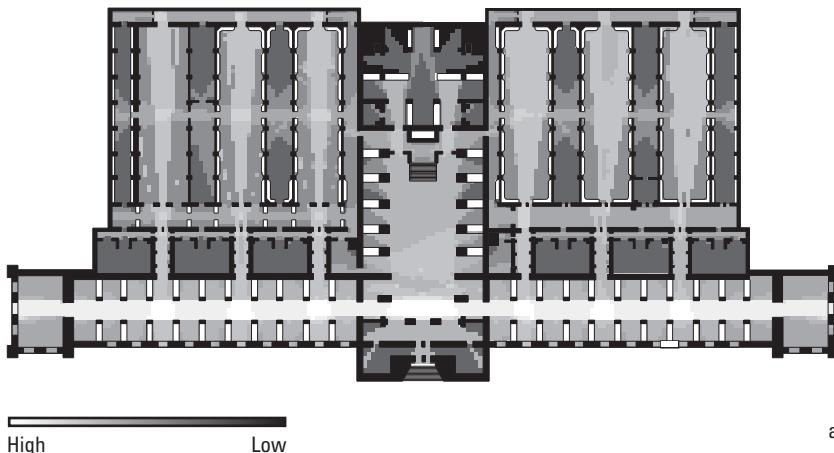
Conditioned by the same architectural convention of centrality the two buildings used this arrangement in reverse ways. In the former the hall did not control access to the exhibitions on the ground floor, but the galleries on the first level could be seen only by traversing this space. In the latter, the hall led to the exhibition spaces on the ground floor, but it was not an essential component in accessing the first floor displays. If the hall is the space from which museum buildings traditionally showed their ceremonial aspects, the Natural History Museum separated the appreciation of the collections on the ground floor from the appreciation of the architecture. Leading to two galleries only on the first level the hall controlled not just the educational content but also the experience of the building as spectacle. The Kelvingrove Museum associates viewing the exhibitions with viewing the architectural spectacle at the entrance level, but separates the art galleries on the first floor from the spectacle of the hall and its symbolic message. The Natural History Museum offers a unique route leading to a unique viewing position. The Kelvingrove Museum with its two-part symmetry provides multiple routes and identical views from identical viewing positions. The long sequence, the ceremonial route and the panorama in the Waterhouse building show the ideological role of the hall in staging a theatrical experience. The variety of routes in the Kelvingrove show the instrumental role of the hall in terms of distributing and integrating a number of different paths, rather than commanding a grand tour and a grand view through the building.

Visibility

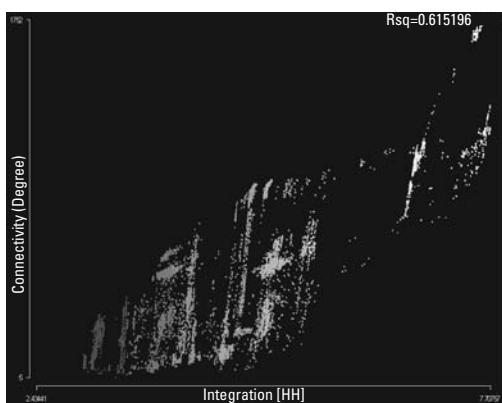
The hierarchy characterizing the structure of routes in the Natural History Museum underlines also the structure of visual information. The visibility diagrams show that integration shifts gradually from the east-west to the north-south direction, and from the front to the rear galleries (see Figure 6.5a). The hall was not very well integrated and did not enable visual connections among the exhibition rooms and their various displays. On the other hand, integration in the Kelvingrove spreads throughout the hall and the East and West Courts, facilitating visual relations at a large scale (Figure 6.6a). The structure of visual information in the Natural History Museum brings out the hierarchical skeletal form of the building with a spinal cord and ribs laid out in an orderly fashion. In the Kelvingrove integration flows from back to front and from side to side. It also highlights the geometrical symmetry on two axes and the interchangeability of spatial locations. Both characteristics would make the building look similar from different places.

Space and the organization of knowledge

We now move to discuss the ways in which the organization of space related to the organization of the display in the two museums. In her review of museums as sites of scientific knowledge Forgan explains that in describing the story of the creation of the Natural History Museum to his contemporaries in the Biological Section of the British Association meeting in 1881, Owen drew a comparison between the architecture of the building and the language of phylogeny, classification, archetypes and 'the traceable evidence of ancestral structures'.



6.5
Natural History
Museum, London.
(a) Visual
integration.



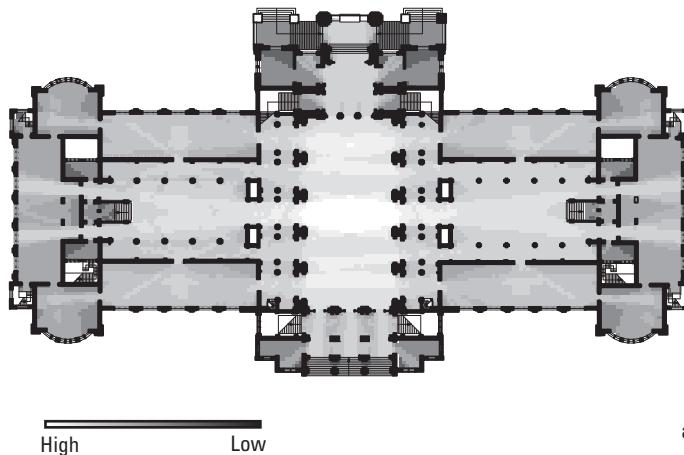
(b) Correlation of
visual integration
and connectivity
values. A good fit
between integration
and connectivity
as captured by
the R square
value indicates
good levels of
intelligibility
(understanding
the whole from
properties observed
locally).

In the new building, one could trace a 'developmental advance' in museum design [in comparison to the previous museum design] which could be seen in the single-storey galleries, improved admission of light, and adaptation of walls as well as floor to the needs of the exhibition. To give added weight to his use of phylogenetic language in architectural metaphor, he [Owen] added a footnote to Cuvier's debate in 1829 with Geoffrey St. Hilaire on the unity of composition or plan in cephalopods and vertebrates, in which Cuvier has distinguished between 'la composition d'une maison, c'est le nombre d'appartements [sic] ou de chambres qui s'y trouve; et son plan, c'est la disposition réciproque de ces appartements et de ces chambres'. Thus, for Owen, the language of archetypes and architecture reflected his own belief in slow developmental advance (1999: 193).

Taxonomies as devised by Linnaeus and Cuvier categorized nature according to physical characteristics into kingdoms, phyla, classes, orders, families, genera and

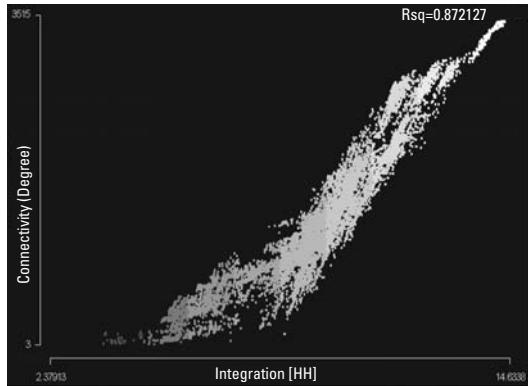
6.6

Art Gallery
and Museum,
Kelvingrove,
Glasgow.
(a) Visual
integration.



a

(b) Correlation of
visual integration
and connectivity
values.



b

species. They are the most hierarchical kinds of knowledge, placing identities in a nested structure of divisions that forbids the possibility of their overlapping. The system will not permit for instance a family containing some examples that are amphibians and others that are reptiles. Essential to classification is that members of a class on one level are more closely related to one another than members of a different division on the same or on a different level. Forgan writes that in the Natural History Museum symmetry, classification and design in nature were blended together with the 'vertebrate' quality of the building and its decoration (1999: 193). Studying the former Birds' Gallery at the east front side of the museum, Peponis and Hedin explained that classification found expression not only in the appearance of the museum but also in the spatial arrangement (1982: 23). The central aisle in this gallery had an asymmetrical relationship with the exhibition alcoves controlling access to them in the same way in which classificatory categories are non-interchangeable.

But the visual separation among spaces and the linear sequence in which they were accessible from the hall show that the hierarchical logic of classification observed by these authors permeated not only the Birds' Gallery but also

the visibility and permeability configuration of the entire building. The exhibition rooms were not visible from each other, corresponding to the strict classification of their contents. In the Kelvingrove, on the other hand, the majority of the galleries were spatially interconnected and inter-visible. Similar to the geometrical ordering defying a clear distinction between front and back and the two sides, the circuits of movement and the open visual relationships constructed a highly integrated building. They allowed the different rooms to 'overlap', blurring the distinctions among exhibition contents.

Foucault explains that classification was the means by which animals or plants were transcribed into language through a process of naming essential to understand their similarities and differences. Natural history reduced the distance between language and the world 'so as to bring language as close as possible to the observing gaze, and the things observed as close as possible to words' (2002: 144). By this means the identifications were fixed into a universal language so that 'naturalists of all countries could understand each other' (Gillispie 1990: 171).¹³ Classification operated at two levels: *structure* and *character*. *Structure* was about designating categories like the constituent parts of a plant. 'By the structure of a plant's parts we mean the composition and arrangement of the pieces that make up its body' (Foucault 2002: 147). *Character* was about 'situating them within the system of identities and differences that unites them to and distinguishes them from all the others' (147). The names obtained from a classification based on *structure* expressed the individuality and identity of plants. But in order to become language Natural History used *character* 'to unite in one and the same operation what everyday language keeps separate' and by doing so lay out a grid – a table – over nature (154).

... a *tabula*, that enables thought to operate upon the entities of our world, to put them to order, to divide them into classes. To group them according to names that designate their similarities and differences – the table upon which, since the beginning of time, language has intersected space (Foucault 2002: xix).

But if naming and the taxonomic table were the means by which the order of things was made visible on a single surface, the building of the Natural History Museum was a different case. The hierarchical conception of nature corresponded to the spatial and visual properties, which allowed connections among galleries only through intervening layers of space. But rendering this conception visible at once, so that things could be seen comparatively like in the taxonomic table, was not possible from any space. This brings us to Le Camus' statement at the beginning of this chapter. The contents of the natural history cabinets could not be known at once as he suggested. What could be known instantly was the 'idea' of the structure of nature, as though it was made 'visible', gazing not at knowledge itself but its symbolic expression.

Owen's reference to Cuvier and 'developmental advance' evokes another idea from natural science and more particularly Cuvier's theories in comparative anatomy. Cuvier produced a new classification of the animal kingdom, establishing

four types of beings, vertebrates, molluscs, articulates and radiates. His attention was focused on the peculiar co-ordination and adaptation of parts in individual organisms. This adaptation enabled an anatomist to draw inferences as to the structure of the entire animal from the observation of a single typical part. '... every sort of being may be rigorously recognised by any fragment of any of its parts ... no one of these parts may change without the others changing also, and consequently each of them, taken separately, indicates and gives all the others' (Gillispie 1990: 282). Cuvier's theory was teleological, permitting prediction of the whole animal from a part even when other parts were absent. The logic of the layout in the Natural History Museum was also embedded hierarchically from the whole to the smallest component. But this logic was primarily 'transpatial', so that knowledge of the building could be built by a deduction of relationships that were absent from direct observation through a pattern of hierarchical differences observed at the local level.¹⁴

How well the two museums informed the visitors about the global structure from relations observed at the local scale can be understood by considering the correlation between what was seen locally from each spatial position expressed through the value of 'connectivity' – the visible area from each isovist – and the global spacial properties measured through the value of integration, which is a global measure. This characteristic is known as 'intelligibility' and captures the similarity between the local and global scale characteristics in a layout (Hillier 2007: 94). A good fit between the two variables indicates that the spatial information from each spatial location matches the spatial configuration at the global level. The values in Figures 6.5b and 6.6b show that the Kelvingrove was far more intelligible than the Natural History Museum.¹⁵ Largely responsible for this difference was the morphological structure. In the former, global scale relationships were immediately perceived from local scale observations, as opposed to the latter where they remained to be pieced together through movement and exploration. The only place where the order of knowledge in the Natural History Museum could be visible was the hall – which never quite materialized in its intended function – or on the plan through a system of correspondences between the geometry and the allocation of content labels in the building.

The Natural History Museum and other museums have been often discussed as the sites of 'visible knowledge' (Marcus 1993: 171). But it is important to clarify that knowledge was 'visible' not because it was directly available to observation, but because all specimens were on display, so that what was known to the experts was also exposed to the visitors (Peponis and Hedin 1982: 24). The second way in which knowledge became 'visible' was through representation, by mapping classification as a conceptual diagram on the spatial organization. If natural history dissolved the distance between things and language, as Foucault suggested, the Natural History Museum dissolved the distance between architecture and knowledge, using architecture to reflect a theory of knowledge based on classification.¹⁶

Conceived, perceived and narrative space

Against this background, we can clarify the relationship between the conceptual and the perceptual properties in the two buildings and the relationship of these

properties to the ways in which they structured their content. The analogy of classification can illuminate this task using the notions of *structure* and *character* from Linnaeus' description. In the Natural History Museum the spatial sequence from the entrance vestibule to the two front galleries and the exhibition spaces at the back of the layout could be seen as similar to the way in which the taxonomical knowledge of the *structure* of plants was transcribed into the sequential motion of language, dividing the description into the same number of paragraphs as there are parts in the plant (Foucault 2002: 147). Linnaeus' wish was that the order of the paragraphs and even the typographical modules should reproduce the form of the plant and that 'the printed text in its variables of form, arrangement and quantity should have a vegetable structure' (2002: 147).

On the other hand, the geometrical properties of the building as a whole could be comparable to the taxonomic table, mapping *character* or the order of knowledge all at once. The overlay of the taxonomic-architectural grid on the sequential unfolding of space-text expresses the building as a progression of parts strung in sequence according to laws of contiguity and adjacency – 'the Root, the Stems, the Petioles, the Leaves, the Peduncles, the Flowers' – and as an intertextual framework of all parts laid out and made synchronous on a grid of relationships, so that the entire network can be grasped simultaneously.

The sequential unfolding of information is directly related to the situated body in space. The 'table' of simultaneous information, on the other hand, the geometrical and spatial structure of a building, defines our knowledge comparatively and from all possible spatial positions. In the Natural History Museum what was perceived and experienced spatially and visually allowed inferences and a mental synthesis of parts to derive the morphology of the building. In the Kelvingrove, however, large scale relations were made perceptually available through a network of routes and visual relations that could be perceived with minimum changes in direction. But, at a more fundamental level, the arrangement of the display consisting of diverse categories of knowledge was modified and made even more flexible by the integrated nature of space. Natural history became co-visible with archaeology, ethnology, manufacture and engineering, while the sculpture displays at the central hall were at the centre of routes distributing movement throughout the building. In the Natural History Museum space was subjected to the conceptual system of classification servicing the curatorial message. In the Kelvingrove, space blurred the classificatory conventions of knowledge through a non-hierarchical system of geometrical and spatial relations.

Nature as creation and as resource

The spatial morphology of the Kelvingrove museum and the diversity of its contents can be best understood if we consider the way in which knowledge about nature was approached in Scotland at the time. Studying Fowke's Museum of Science and Art in Edinburgh, Yanni explains that it was influenced by the Scottish educational system, which saw education as intrinsically linked with the practical purposes of industry on the one hand, and by the need to introduce Scottish people to the idea that utility and beauty were aligned on the other.

... the ideology at the core of Scotland's national museum, an institution which combined natural history and industry, reflects one Victorian view of natural knowledge: nature served Scottish industry, and industry, in turn, would bring the world together in one civilized market. By combining natural history and industry, the museum would present these subjects to the public as united, not opposing, branches of knowledge (1999: 98).

Bennett argues that the ideology of the nineteenth-century expositions was driven by a transformation of industrial products and art objects into 'material signifiers of progress' (1995: 67). With an educational value system focused on progress and industry, a great deal of enthusiasm in planning museums in Scotland came from the success and the popularity of the great exhibitions and more particularly the 1851 exhibition in Crystal Palace. Fowke designed the Edinburgh Museum like an exhibition building with a top-lit hall surrounded by an arcade and tier balconies (see Figure 7.3b). A few years later his design of the Natural History Museum was criticized by Kerr as a 'bazaar'. However, the Edinburgh Museum was seen as being suitable for displaying industry and commerce in the manner of great exhibitions.

At the Edinburgh Museum of Science and Art, looking at a selection of decorative arts, including many objects similar to those that had been on view at the Crystal Palace (such as metalwork, porcelain, and patented engines) were crowd-pleasing attractions. Next to these commodities, natural substances from which products could be made – especially rocks and ores – were exhibited with additional geological specimens, including fossils. Since fossils provided information on the age of the earth and its extinct and living inhabitants, geology was linked to zoology. Skeletons, stuffed animals and animals preserved in spirits, completed the zoological department. The boundaries between natural science, art and industry were made flexible: as Adam White had written in 1850, in the earliest proposal for a Scottish national museum, natural history was made 'co-extensive with art and science' (Yanni 1999: 109).

Similar to the Edinburgh Museum, the Kelvingrove was based on the success of two international exhibitions. The building did not have an exhibition style, but the direct association of the museum with these events and its diverse content indicate that it was in alignment with the industrial character of Scottish education. The purpose of the museum was to show the material and cultural wealth associated with natural science, and the knowledge emerging from the appropriation of nature through industry and trade. In conclusion, the differences between the Natural History Museum and the Kelvingrove can be explained by two different approaches to the definition of nature. The first was an encyclopaedic museum that saw nature as divine creation and used space to map knowledge as a conceptual hierarchical system. The second was the result of a social framework that approached nature as a resource for trade. The organization of the layout and the exhibition did not progress from an existing model of discourse to a hierarchical structure of space.

On the contrary, they allowed the integrated and fluid network of spatial relations to render the discipline of natural science and other disciplines coextensive.

Science and spectacle

The spatial differences between the two buildings should be seen not only in relation to their intellectual dimensions, but also to the ways in which they were seen as carrying social meaning and expressing their purpose. At the time the Natural History Museum was being designed Owen and Huxley, a middle-class secular evolutionist, disagreed on the scope of the collections. Owen and Huxley knew that the classified displays were readable only to those who understood the underlying taxonomies. But Owen proposed to show the diversity of the creation to a wide audience, celebrate 'the act of looking', and the implied association between the truth of the natural world and the imperial archive (Yanni, 1999: 114). Huxley instead promoted a secular view of science, suggesting that the museum should show few specimens and place the majority in storage. These opposite views capture a growing dichotomy between science and learning, developing the discipline and shaping the educational experience and the cultural image of the museum for the public.

At the same time Owen's view was part of a curators' tendency in the nineteenth century to reinforce their own status as guardians of complete collections directing a miniature of the universe. Owen had no department of his own in the museum. Separate keepers were directing the four science departments, making the central and north halls the only areas that he could control truly (Thacray and Press 2001: 94). His symbolic idea of the central hall became evident in the spatial characteristics of this space. As the analysis shows, it did not hold a strategic position in the structure of circulation on the ground floor, where most of the exhibitions were placed, but controlled access to the top floors through a ceremonial promenade that offered spectacular views from key points. In addition, the hall did not integrate the spaces visually but structured the theatrical experience of the building. If the museum was the 'book of nature' linking with the divinely created universe, the Index Museum was the compendium of nature, reinforcing the superintendent's role as a minister of scientific knowledge and the imperial collection.¹⁷

A second debate associated with the institutional history of the museum was between the architect Robert Kerr and Francis Fowke, the engineer who produced the original design. Calling Fowke's design a 'bazaar', Kerr characterized exhibition-style buildings with their great height and width surrounded by balconies and lit from the roof as inappropriate for public buildings and museums for science. Kerr's characterization fitted the Crystal Palace building, Fowke's 1862 Exhibition building and his Edinburgh Museum for Science and Art.¹⁸ Like Huxley, Kerr was a supporter of a small scientific museum. His criticism of Fowke's design expressed strong dilemmas characterizing the evolution of museums. Was their purpose for amusement or education? Were they places for scientific research or for the larger public? Did they generate and promote knowledge or did they produce spectacles?¹⁹

As far as Owen was concerned the natural history display was superior to a display of industrial arts because of its religious, scientific and imperial purpose

(Yanni 1999: 115). But he did not see any division between science and spectacle. On the contrary, he promoted the idea of the museum as a spectacular building. Combining the low levels of integration of the hall with the panoramic surveillance over the hall from the top balcony and an ecclesiastical iconology, the museum conflated the religious idea of the divine project of nature with the imperial project of collecting. In the Kelvingrove natural history was not superior to the industrial arts or other disciplines. On the contrary, it was associated with them, promoting a national industrial agenda. The diverse content of the museum, the integrated interior and its architectural language all indicate that it promoted the idea of a secular place devoted to the appreciation of culture and nature.

Power and space

Writing about the formation of the museum, Bennett explains that museums became useful within the context of larger cultural changes in the nineteenth century and the exercise of new forms of power that were assigned to civilizing the population as a whole (1995: 19). Drawing from Foucault's ideas about power and knowledge, and with specific reference to Bentham's panopticon, Bennett argues that the museum was a mechanism for embodying power and making it visible in a spectacular way. An important part of this programme was to use the visitors themselves as a 'regulatory resource' (1995: 55). The Crystal Palace for example had an arrangement of visual relations between the public and the exhibits so that 'while everyone could see, there were also vantage points from which everyone could be seen, combining the functions of spectacle and surveillance' (1995: 65). In these exhibitions Bentham's central position became available to the public, which 'regulated itself through self-observation' (1995: 69).

The two museums I examine here worked as celebrations of orderliness and public edification. However, they constructed different kinds of spectacles and forms of public surveillance. In the Natural History Museum inter-visibility of locations and self-regulation were possible inside the hall and the front two galleries. The smaller galleries at the back of the buildings would offer a more private experience, limiting the possibility of large-scale surveillance. However, the building controlled movement through a hierarchical sequence of spaces. In the Kelvingrove, on the other hand, because of the high levels of visual integration visitors could be seen from many different spatial locations. But it was also possible to access the first floor, skipping the central space, or browse the collections on both floors through the rings of circulation. Therefore, the two buildings controlled but also empowered visitors in different ways. The Kelvingrove offered the most relaxed experience of the two, providing a diverse way to access the exhibitions.

The proposition that museums were sites of power expressed in a spectacular way illuminates the nineteenth-century institutions and enables museum historians to see the subject of their discourse within the broader perspectives of cultural theory. However, as the analysis showed, there are different forms of power depending on different forms of control over the visitors' patterns of visibility and movement. Not every space in the two museums worked like a panopticon, offering possibilities for more private experiences and circuits of movement. In addition,

inter-visibility in large buildings of an urban metropolis was a mechanism that did not simply control people but also protected their anonymity in a large crowd, exactly because of the distributed form of surveillance to each individual.

More importantly, both institutions, and nineteenth-century museums in general, had every object in display reducing the distance between the curators and the public, as though the two social groups had equal access to knowledge (see Figure 6.7). This distance increased once collections became larger, undermining the coherence of the display and the ability of the museum to act as a total encyclopaedia (Forgan 1994: 151). 'In effect, the educative function at whatever level, useful or otherwise, meant that museums were in competition with the newer colleges and universities, and these provided pedagogical regimes based on different premises' (1994: 151). Museums of the nineteenth century, therefore, were more egalitarian than contemporary institutions, which impose a distance between knowledge and the public through the medium of interpretation.

In addition, there is power and social control exercised by different social agents. As explained before, the Natural History Museum was a site of multiple contests among curators, scientists and architects. The kinds of power associated with each group varied considerably, focusing on a debate about whether the museum was a site for the production of knowledge or for large-scale learning. They also varied in terms of the institutional structure, which separated the various departments from the central administration. Finally, they were different in terms of the available theories of knowledge and the scientific groups that supported one theory over another. The debate about what kind of knowledge should be promoted in the museum continued in later years. By the time it was completed scientific



6.7
Natural History
Museum, London,
Osteology Gallery
1892.

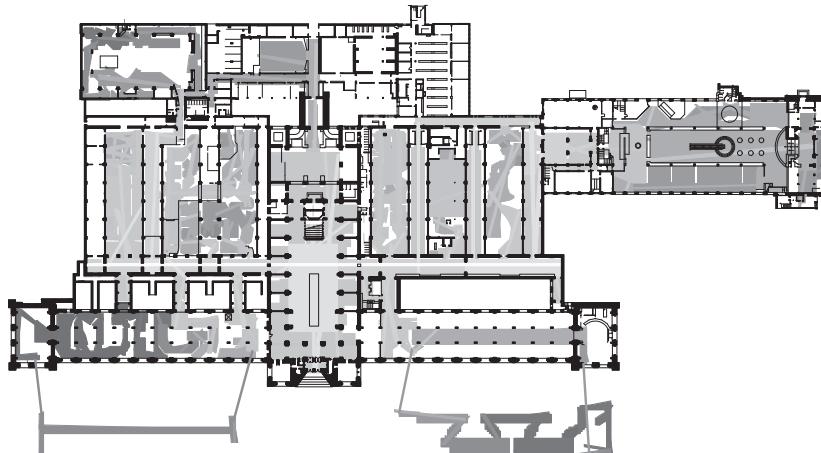
theories had already moved beyond those incorporated in the architecture (Yanni 1999: 145). Darwin's *Origin of Species* had established the mutability of animals in their descent out of the past, liberating 'biology from its limiting dependence on classification and dissection' (Gillispie 1990: 307). Fowler, the director who replaced Owen, denounced the architecture of the museum for not recognizing evolution, enforcing an old distinction between living and extinct species through their separate locations on either side of the hall (Yanni 1999: 145). So, power lacked a single form or a simple level of operation. It was exercised among many groups and shifted focus with the development of new scientific knowledge.

Finally, it is essential to distinguish between power as a form of social control and as a spectacle expressed through a symbolic message. In his discussion of the scientific and religious theories associated with the centralized Renaissance churches, Evans explains that geometry, cosmology and theology could not support the reality of ideal forms in the diversity of nature, or any other claim of unity and orderliness. He concludes that centrality in these churches was a representation of that stable unity that the world actually lacked (1995: 43). Similar to the centralized churches, the coherence and spectacular spaces of the Natural History Museum projected the combined power of the divine and imperial project of nature. They implied an illusionary coherence of power over and above the power divides among scientists and curators.

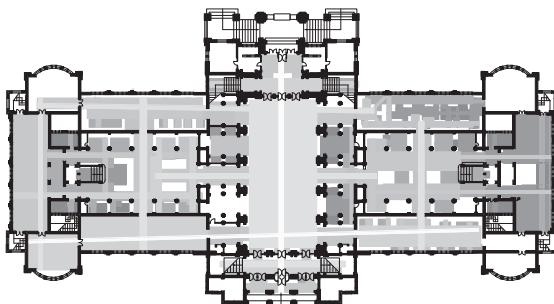
I should perhaps remind the reader that a similar observation was made in the first chapter in which I examined the varied framework of myth in fifth-century BC Athens and the ways in which it was embodied in the Parthenon and the Erechtheion. The Parthenon organized diverse mythical narratives under a hierarchical conceptual and spatial schema to express the imperial power of Athens. The Erechtheion, on the other hand, stands as a demonstration that myths and religious beliefs lacked a conceptual organization into a total system. These observations do not undermine the consideration of museums as expressions of social control, but point to the need to examine how the spatial structure of buildings work using also historical evidence about their social organization. Based on the study of the two buildings, I can ultimately suggest that their spatial properties and exhibition strategies were not expressive of the entire and complex set of operations underlying power and knowledge or the organization of power over society as a whole.

The contemporary situation: space and the social character of the visit

I will now discuss the two museums in their contemporary context with reference to the way in which the spatial organization and the approach to displaying relates to the social character of the visit. This discussion can place the subject of this book in the social context of buildings, looking how they construct frameworks of social encounter and human experience. Since its opening the Waterhouse building, now named the 'Life Galleries', grew into a large complex extending to include a new Whale Hall in 1932, and merging with the Geological Museum in 1985, named the 'Earth Galleries'. The Life and Earth Galleries can be accessed independently, each through its own entrance, but new links were opened at the north-east edge of the



6.8
Natural History
Museum, London,
'Life Galleries' and
'Earth Galleries',
(2001). Integration.



6.9
Art Gallery
and Museum,
Kelvingrove,
Glasgow, (1999).
Integration.

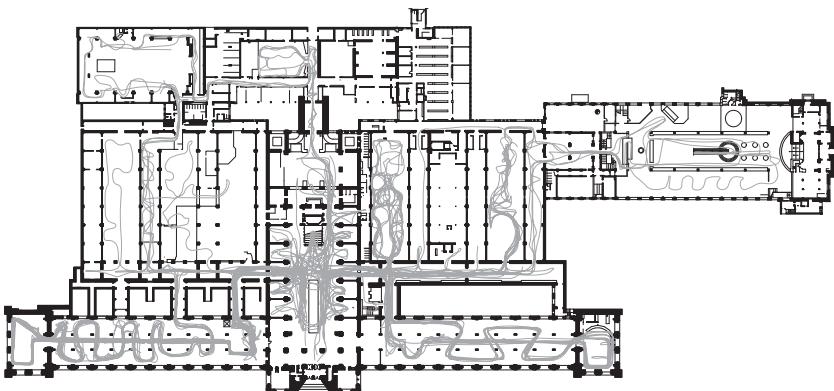
original building to connect with the new annex. Another transformation was the opening of two arches in the main hall, creating a long axis, known as 'Waterhouse Way', that links the exhibition spaces on the west with those on the east side (see Figure 6.8).

The approach to exhibiting until the end of the 1970s had followed the traditional model, where visitors learned by looking at a large array of exhibits. The opening of the Human Biology Hall, 'an exhibition of ourselves', in 1977 was the first interactive exhibition, encouraging visitors to explore the senses and the process of abstract thought as aspects of the human condition. This approach to exhibitions, as Peponis and Hedin observe, emphasized spatial fragmentation linking spaces through circulation rings that encourage small-scale observation and a variety of experiences (1982: 24). With the redesign of the former Birds' Gallery and the Gallery of Mammals to accommodate the 'Dinosaurs' exhibition and the 'Ecology' exhibition in the nineties respectively, the approach to display was that of the 'black box', blocking natural light to construct an isolated world of exhibition experiences. But, more importantly, the spatial arrangement inside these exhibitions created a single sequence, taking visitors through a gradual discovery of a story.

In contrast to the Natural History Museum, the Kelvingrove did not undergo a significant expansion until recently, retaining its original spatial form at the

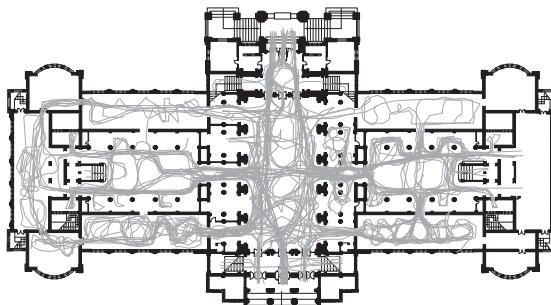
6.10

Natural History
Museum London.
Visitors' paths.



6.11

Art Gallery
and Museum,
Kelvingrove,
Glasgow.
Visitors'
paths.



scale of the whole building.²⁰ But the interior organization of the exhibitions altered the symmetrical structuring of the museum through tall cabinets that fragmented the gallery spaces and decreased the length of the visual axes (see Figure 6.9). However, the diverse display has continued to exist to the present day under the curatorial departments of History, Science and Art. In addition, in spite of an increased spatial complexity, the exhibition layout stayed away from contemporary approaches that string spaces in linear sequences, enabling the circulation structure to retain the original interconnections among galleries.

The structure of integration at the ground floor of the Natural History Museum shows the integrating role of the Waterhouse way linking the galleries on either side of the main hall. However, the spatial break up inside all the gallery spaces makes them segregated and disconnects them from the global structure of the building (Figure 6.8). This characteristic expresses the ideological approach to exhibiting based on a narrative sequence in which the public has to surrender personal choice and learning to a didactic experience. In the Kelvingrove in spite of the spatial subdivision of galleries by tall objects, the distribution of integration continues to allow large-scale links between the central space and the galleries and among the galleries themselves (see Figure 6.9). So, the spatial layout and the planning of the display have retained the original characteristic of the museum,

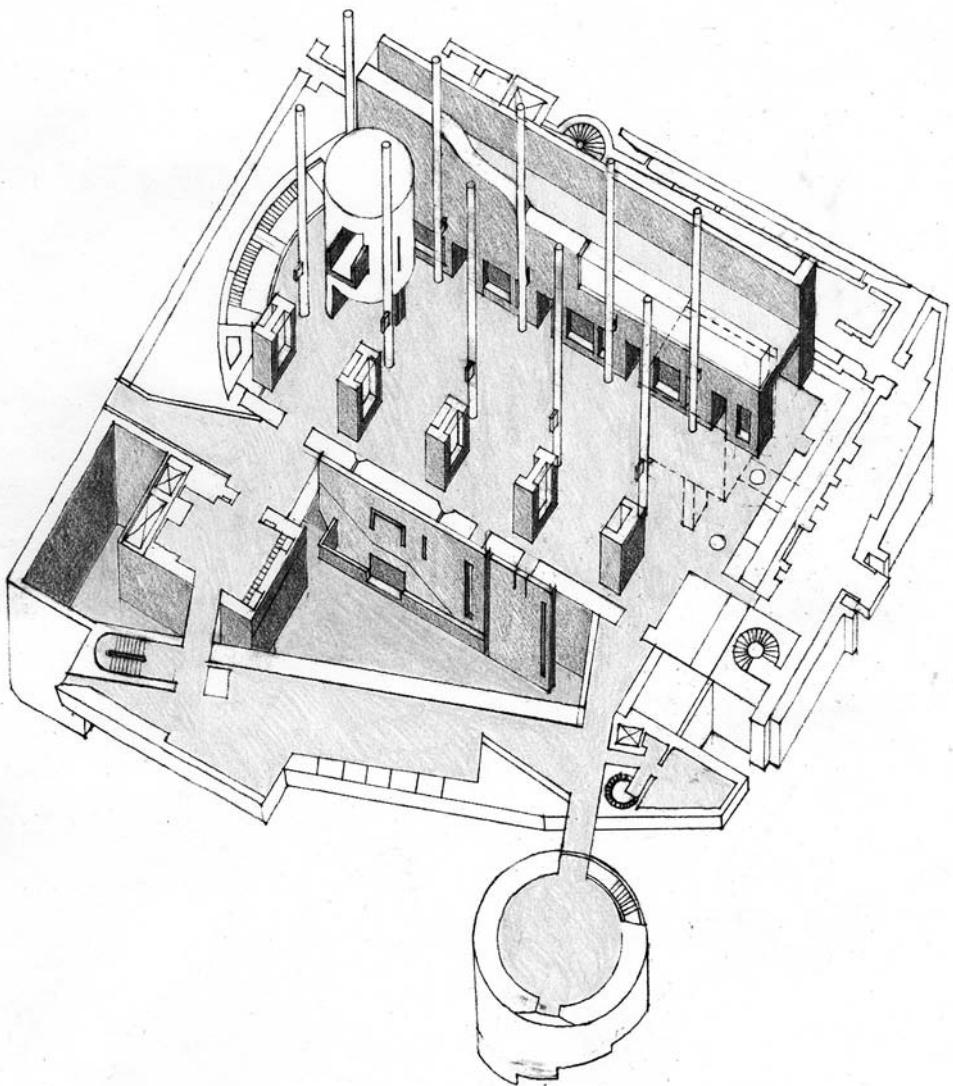
allowing choice regarding the order in which exhibits are seen and interaction among different areas of knowledge.

A study of the visitors' routes showed that movement and viewing in the two buildings encapsulate their differences in terms of the spatial organization and the approach to display. The tracks of visitors' paths in the Natural History Museum follow the spatial logic of the layout gathered in the main hall and distributed to the exhibition spaces like the trunk and the branches of a tree.²¹ In contrast, visitors in the Kelvingrove circulate freely using the loops of circulation and browsing the collections (Psarra and Grajewski 2002b: 37, Psarra 2005: 87) (see Figures 6.10, 6.11). The viewing patterns in the former reveal large differences in terms of visitors' densities between popular exhibitions ('Dinosaurs', 'Ecology', 'Creepy Crawlies', etc.) and the rest of the galleries, suggesting that the emphasis is on the didactic and consuming character of the visit. In the Kelvingrove viewing rates are more equally distributed among galleries on the ground floor, showing that the visit is self-guided and socially interactive. Visitors in the Kelvingrove see the museum as an informal social and educational setting rather than as a 'themed' space for large-scale consumption.

Based on a similar study conducted in the Tate Britain in London, Hillier suggests that space can be used in a 'conservative' or 'generative' mode. The former prescribes experience, while the latter shapes a social pattern of social co-presence (2005: 98). It seems that the Natural History Museum works in a prescribed way. The Kelvingrove, on the other hand, could be considered as a permissive or a generative model of a museum. These two models are found to permeate all levels of properties in the two buildings from the conceptual organization to the spatial characteristics observed in perceptual experience, and from their spatial structuring to the patterns of visitors' movement.

Conclusion

This study has enabled us to locate the key issues addressed in this work within the areas of spatial layout and the organization of knowledge in two nineteenth-century museums. Our discussion showed that the design of the Natural History Museum was conditioned by contemporary scientific methodologies. In contrast, the Kelvingrove was designed not as a *reflection* of a theory of knowledge, but as a *generator* of potentially new knowledge based on spatial interrelationships among gallery spaces. These facilitated an exchange between science and the socioeconomic practices of industry and trade.



7.0
Museum of
Scotland,
Edinburgh,
Benson+Forsyth.

Chapter 7

Contemporary experience

The Museum of Scotland, Edinburgh and the Burrell Collection, Glasgow

There are two ways of walking through the wood. The first is to try one or several routes (so as to get out of the wood as fast as possible, say, or to reach the house of grandmother, Tom Thumb, or Hansel and Gretel); the second is to walk so as to discover what the wood is like and find out why some paths are accessible and others are not.

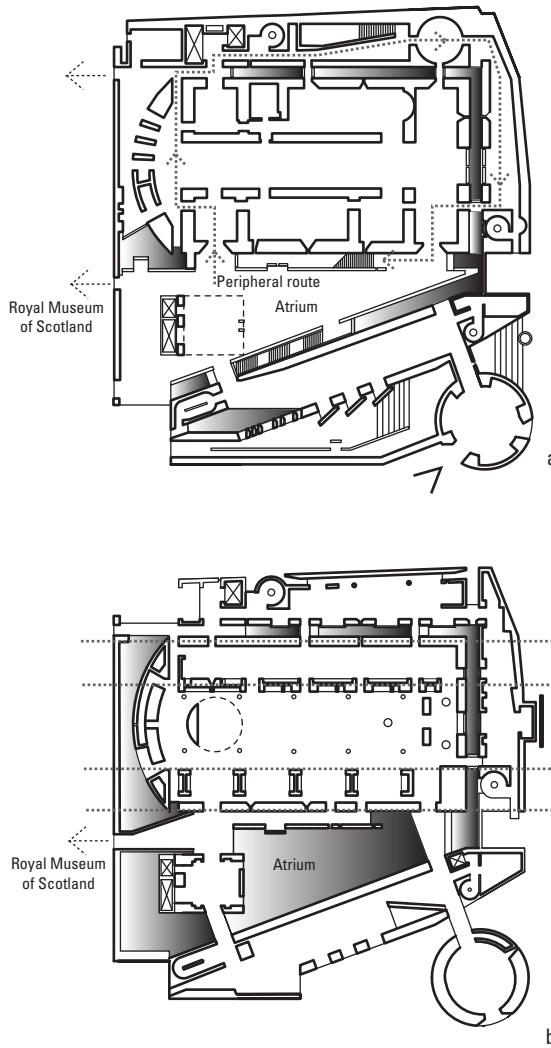
– Eco, U. (1994b), *Six Walks in the Fictional Woods*, Cambridge, Mass.: Harvard University Press, p. 27.

Introduction

Discussing the evolution of museums as sites of ‘visible knowledge’, Marcus notes a difference between the ‘well lit warehouse’ with neutral galleries of the Enlightenment and the integration of the building with the displays in contemporary buildings, such as Scarpa’s Castelvecchio and Gasson’s Burrell Gallery in Glasgow (1993: 171). On the opposite side are museums like Foster’s Sainsbury Centre continuing the ‘warehouse’ tradition. Museums of this tradition can be ‘dissociated from their contents and usable for any type of object in any sequence’ (171). The integration of the building with the displays is a characteristic of museums of the late twentieth century. It is associated with changes in architectural ideologies and the decisions that influence the organization of exhibitions. In this chapter I look at two contemporary museums that integrate the display with the building: the Museum of Scotland in Edinburgh by Benson and Forsyth, and the Burrell Gallery in Glasgow by Gasson, Meunier and Anderson. The intention is to understand how architecture relates to exhibition design, and how these museums differ from the so-called ‘neutral’ Victorian buildings explored previously.

The two museums are selected as examples of the same typology, establishing a dialogue between the architecture and the collection. However, a

closer view indicates that they are diametrically different. The Museum of Scotland is situated in a historical area in Edinburgh, while the Burrell is close to dense woodland in Pollock Park in Glasgow (see Figures 7.0, 7.1a–b, 7.2a–c). The former has its origin in the Williams report and its proposal for a building to re-house the old Museum of Antiquities and present the history of Scotland (MacMillan 1999: 111). The latter houses the diverse art collection of William Burrell, a Glasgow ship-owner (Norwich 1983: 7). The Museum of Scotland opened during a period of national self-assertion marking the devolution of the parliament to the Scottish nation. The Burrell, on the other hand, celebrates one of the most important collections created by one person. So, in spite of their differences, the two buildings were shaped by the requirement to respond to a particular vision of identity, the first one associated with a national identity, Scotland, and the second with William Burrell, the donor of the collection.



7.1
Museum of
Scotland,
Edinburgh.
(a) Ground floor
plan.
(b) First floor plan.

The second purpose in this chapter is then to explore how the two buildings create a particular expression of identity through the ordering of space and the collection. It is argued that the Museum of Scotland organizes the exhibitions historically and uses space to express the transformation of Scotland from a pre-industrial to an industrial nation. The Burrell engages with the expression of the collector's identity in the public areas of the building. But inside the galleries it arranges objects on a grid of spatial locations, facilitating aesthetic juxtapositions of artworks instead of an overpowering message.

Architecture and spatial morphology

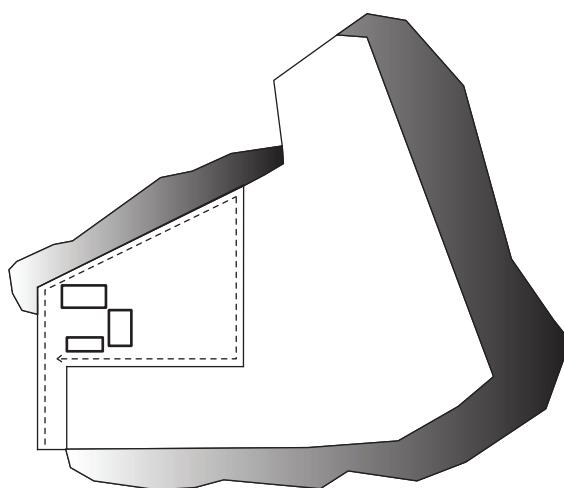
Context and iconography

The Museum of Scotland is located at the site of Bristo Port, which was the main southern gate of the city, at the crossroads of six streets: Bristo Port, Bristo Street, George IV Bridge, High Street, Chambers Street and Forrest Road. In terms of the larger urban context, it is situated at the convergence between the medieval fabric of Edinburgh and the seventeenth and nineteenth-century planned town. The actual site was once Brown's Square, and the cylindrical tower forming the entrance to the museum now marks the intersection of the six roads. For Duncan MacMillan this tower is 'like a memory of the city's ancient gate, for it is through it that you enter the building' (1999: 110). But one can also enter through the adjacent Royal Museum of Scotland, the former Edinburgh Museum of Science and Art, an exhibition style building built by Fowke in 1889. Joined together, the two buildings provide an example of the evolution of museums from the 'neutral' display of objects inside top-lit galleries to the aesthetic integration of objects with architecture (see Figure 7.3a, b).

The Museum of Scotland is connected with local history in an intimate way, from the urban grid and the neighbouring cultural sites to the country's political self-assertion. The Burrell, on the other hand, is implanted in Pollock Park rather than knitted in a historical fabric.¹ Burrell wanted the collection to be housed in a building located 16 miles from the centre of Glasgow, so that the works of art would be seen to their greatest advantage. He must have considered the museum as a 'country house', specifying the reproduction of three rooms from his residence, Hutton Castle near Berwick-on-Tweed, to recall the original context from which the display originated. Another condition in his bequest was the integration of stone arches from Hornby Castle from his collection into the building (Gasson 1983: 15).

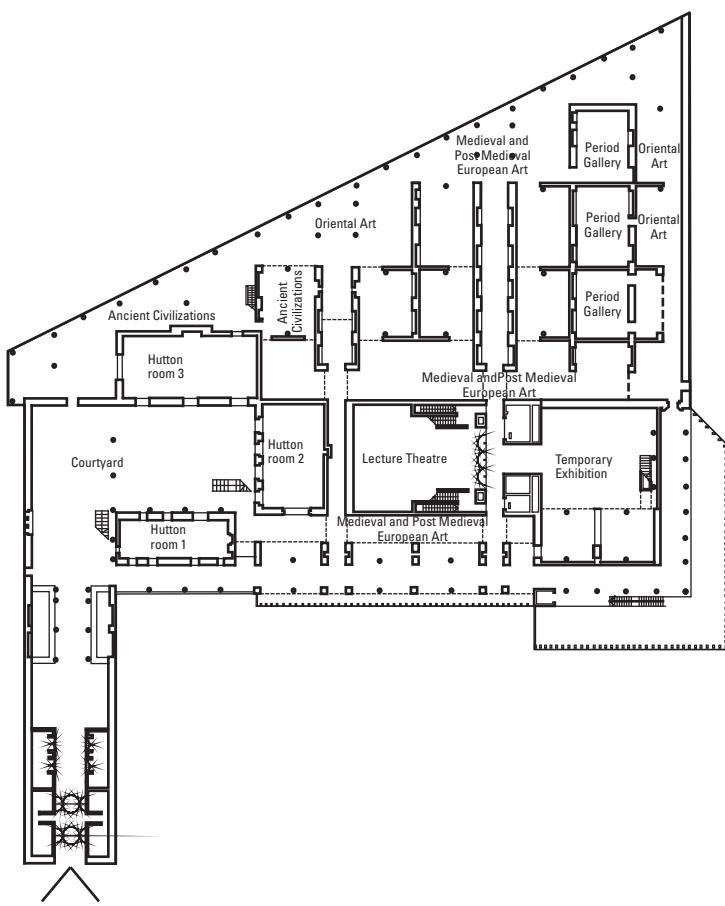
The two museums are charged with symbolic messages based on the language of form, space and materials. Massive and stone clad, the Museum of Scotland is perforated by a number of openings providing visual contact with the surrounding buildings from key spatial positions. Its design is informed by historical iconography with the entrance tower echoing the half-moon battery, and the central volume of galleries alluding to St Margaret's Chapel in Edinburgh castle. Other historical references are found in the cut openings of the pavement on the north-west corner of the site reminiscent of a defensive moat, and the curved wall of the gallery tower recalling a Pictish broach (MacMillan 1999: 116). The Burrell also refers to medieval traditions through the courtyard, the three Hutton rooms and the

7.2
Burrell Collection,
Glasgow, Gasson,
Meunier and
Anderson.
(a) The perimeter
route.



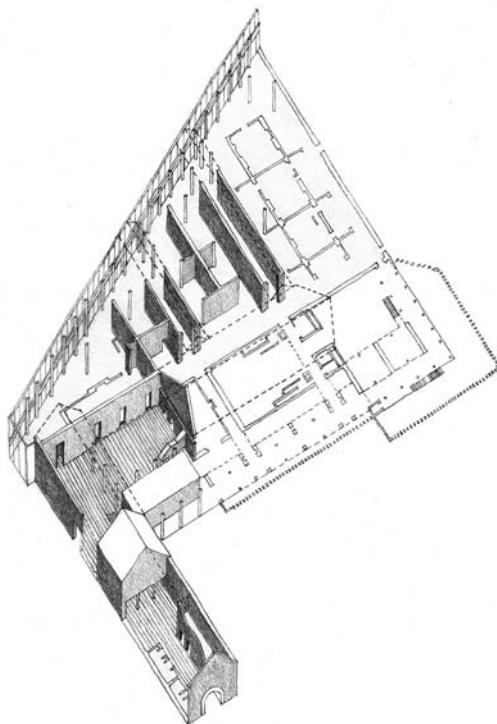
a

(b) Ground floor
plan.



b

(c) Axonometric.



arches incorporated into the physical fabric. But while the former is modelled as an integral part of the local architectural context, the latter houses the transplantation of architectural artefacts from diverse contexts. The Museum of Scotland implies that it is part of the historical continuum that shapes the city. The Burrell holds moments of many histories and rearranges them to recall the collector's history and the universal history from the art objects. But the main interest is to move beyond the symbolic function of these buildings and examine the arrangement of space and the ways it relates to the exhibitions. In what follows I look at the conceptual strategies of the two museums to identify the main characteristics, which can be consequently compared to the spatial properties observed in the interior.

Sculptural versus tectonic

The Benson and Forsyth museum comprises six floors and is composed as a series of spatial layers defining an inner volume of galleries and a peripheral group of volumes. The inner and the outer spaces are separated from each other through a triangular atrium and top-lit shafts that are crossed by balconies and bridges (see Figures 7.0, 7.1, 7.3a).² The inner volume is covered by a roof terrace offering panoramic views of the city and its monuments. The Burrell extends horizontally with the largest part of the collection located on the ground floor, a collection of paintings situated in four galleries on the mezzanine and a restaurant at the lower level. The architects designed it as a perimeter route, a 'walk in the woods' (Gasson 1985: 16), creating

7.3
Museum of
Scotland,
Edinburgh.
(a) Atrium.



(b) Royal Museum
of Scotland, former
Edinburgh Museum
of Science and Art,
atrium.



an intimate connection between the artwork and nature (see Figure 7.4a, b).³ The design grew also from the requirement to mark Burrell's personality in the museum. This led to placing the replicas of the three rooms – furnished as they were in his house – around a top-lit courtyard that receives the visitors immediately after entering the building (Figure 7.2a, b, c). The spatial layers in the Museum of Scotland create a dialogue between the spaces along the perimeter and the volume at the centre of the layout. This volume is also divided into layers, pronounced by a central longitudinal space that is surrounded by two bays of galleries (Figure 7.1b). In contrast to this layering effect the Burrell has no single focus, distributing an orthogonal matrix of spaces under the horizontal extension of the roof.

A second key difference between the two buildings concerns their structural strategy. In the Museum of Scotland the columns are hidden inside thick walls. In the Burrell they are visible, carrying an exposed timber roof structure (Figure 7.4a, b). The disguise of the structural system and the prominent wall thickness in the former imply a load bearing strategy that matches the qualities of the building as layering and carving. The exposure of the columns in the latter corresponds to the grid-like arrangement of its spaces, following the structural logic. The Benson and Forsyth museum derives its architectural expression from its three-dimensional sculpturing. The Burrell gives less emphasis to sculptural articulation and more to tectonic expression. The intention of the architects was to celebrate through the simple construction of the roof the act of 'making', an act mirrored in the art objects and juxtaposed with the natural context against which they are displayed (Gasson 1985: 16).

Moving and viewing

On entering the atrium in the Museum of Scotland the visitors are offered expansive views of this space enlivened by staircases and bridges. The floor stands clear of the walls on three sides, connecting with the basement through light-wells and a staircase. Daylight penetrates the lower level from the roof and from the moat-like excavation at the front and the west side of the building (see Figure 7.5). Excavation provides a powerful idea for 're-siting' objects back in their 'historical underground', lit from the top – a strategy pursued by John Soane two centuries earlier in his house. Access to the exhibitions on the basement and the ground floor is through the atrium to which the visitors return to take the stairs and lifts leading to the upper levels. The inner 'tower' of galleries contains individual rooms on the ground floor, and on the first floor, a lofty hall at the centre. Running along the length of the building and overlooked by a cascade of spaces, this hall is lit from clerestory windows beneath the boat-shaped ceiling that holds the roof terrace (see Figure 7.6). To move between the inner and the peripheral galleries the visitors have to cross the bridges that are suspended inside the voids. Hovering in the interstitial gap between these zones, they experience a tension between the horizontal extension of the plan and the dramatic reappearance of the section. The juxtaposition between vertical and horizontal, the penetration of light from the top and the recurrence of long vistas, openings and slits promote a Soanian romantic idea of architecture as evoking sensations and emotions, constructing a theatrical experience.⁴

7.4
Burrell Collection,
Glasgow. (a, b) main
exhibition area.



In the Burrell the visitors access the exhibition area through a Hornby arch embedded in the sandstone wall of the courtyard at the north side.⁵ Entering this area they experience the unexpected appearance of the display stretching next to the woodland along the north glazed edge of the building (Figure 7.4a, b). This sudden transition is marked by a shift of views from the north-south direction of the access route to the diagonal axis in the gallery space, and by the change of the material from red sandstone to plaster (see Figure 7.7). The northern boundary follows the grove's edge, adjusting the orthogonal geometry of the layout to the informality of the landscape. The exhibition area at the north and the tapestry galleries on the opposite side are overlooked by the exhibition spaces at the mezzanine level extending from the east to the west side of the building.

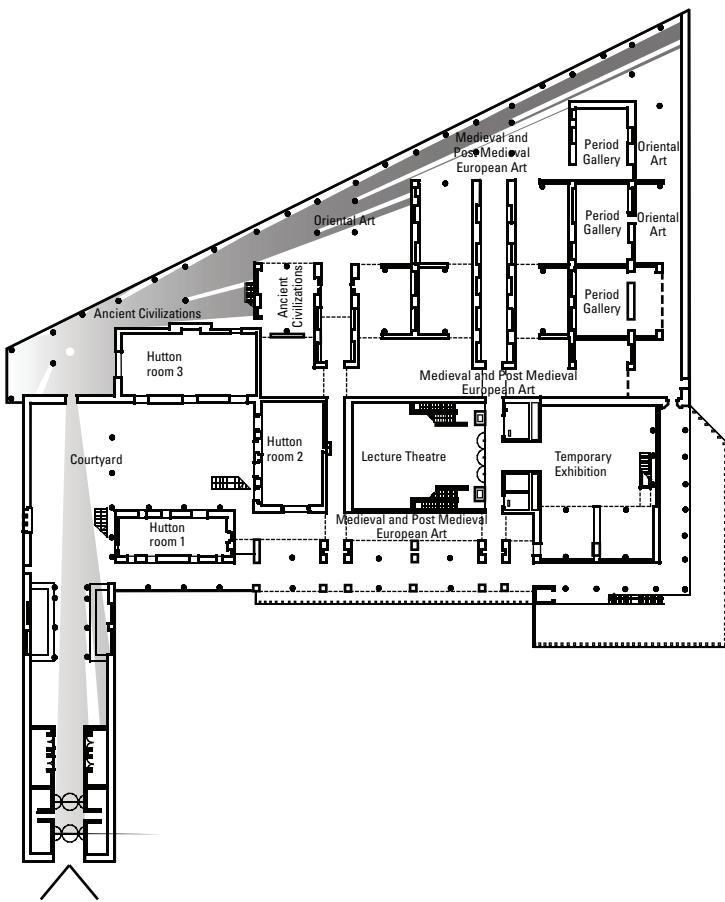
The ground floor galleries in the Museum of Scotland are axially linked, through long axes of sight that extend throughout the layout as in an enfilade sequence. The vistas are not always associated with movement, offering oblique, narrow or panoramic perspectives (see Figure 7.8). They are punctuated by balconies, bridges, stairs, openings, shafts and art objects that stimulate the visitors to explore the building and the collection. In the Burrell the galleries were also designed to facilitate 'juxtapositions that are both intentional and a surprise' (Gasson 2001: 18). They consist of semi-open spaces that are inter-visible in groups of two or three along the north-south direction. In this way, views to the north side of the park are frequently possible not only from the perimeter of the plan but also from the deepest parts of the layout (see Figure 7.9). On the whole, the Burrell has a pronounced spatial arrangement with alternating bays of exhibition spaces and axial routes in



7.5
Museum of
Scotland,
Edinburgh.
Basement.

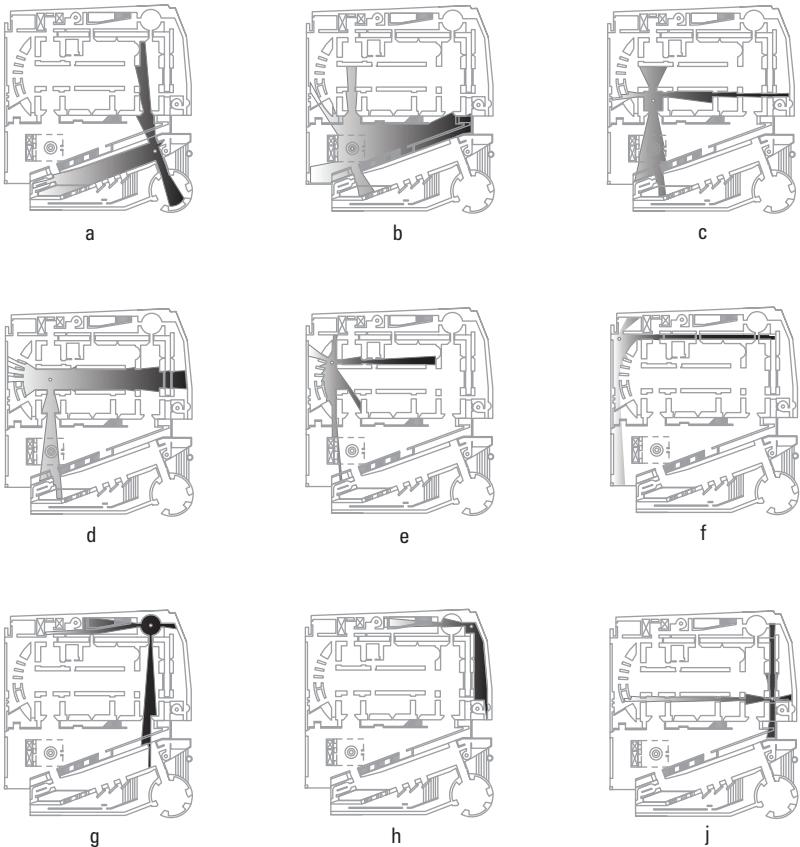


7.6
Museum of
Scotland,
Edinburgh. Central
exhibition space on
first floor.



7.7
Burrell Collection,
Glasgow. Isovist,
exhibition area.

7.8
Museum of
Scotland,
Edinburgh. Ground
floor, isovists.

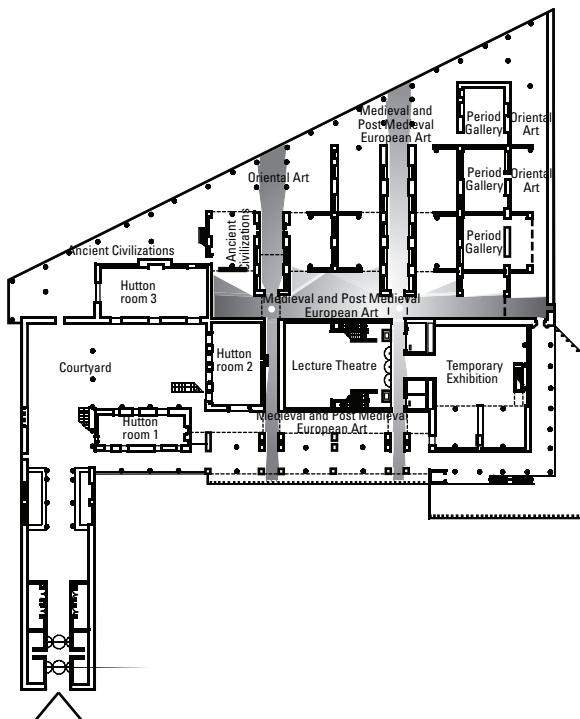


the form of day-lit galleries that stretch from side to side. The Museum of Scotland has also a clear pattern of axial visual relationships. But the high levels of visual interest it constructs seem to attract attention from the axial views to the sculptural complexities of the building.

Route structure

Turning to the circulation structure, we see that in the Museum of Scotland there is a peripheral route on each level, which allows one to omit a large part of the inner gallery section, and a number of smaller circulation rings intersecting the large route through the bridges that cross over the voids. A similar arrangement is found in the Burrell with the perimeter route encircling the building and smaller rings of movement crossing the large sequence. So, in both buildings the visitors can access the exhibitions either in a directed way through the large sequence, or in individual ways through the various detours and diversions.

Although the itinerary systems in the two museums are in principle similar, they have strong differences. The perimeter path in the Burrell is simpler than the peripheral routes in the Museum of Scotland. Extending next to the glazed boundary it guides the viewers through the straightness of the route, the axial



7.9
Burrell Collection,
Glasgow. Isovists
from the Tapestry
Galleries.

views and its constant contact with the park throughout the visit. In the Museum of Scotland the large sequence covers a range of spaces in terms of shape and size as visitors move from the inner galleries to the outer volumes and in the opposite direction (Figure 7.8). There is a clear distinction between the peripheral spaces and the inner gallery volume through the vertical shafts that cut throughout the building. Circumnavigating and penetrating the inner gallery core and the main hall visitors repeat with their steps the encircling function of the voids and the perimeter spaces. This recurring path translates a conceptual strategy of spatial layering to an experiential strategy based on movement. Bringing the conceptual patterns to the level of perceptual properties the building attracts attention to the rules by which it is shaped as the main agent that orders experience. In the Burrell the perimeter route enlightens the visitor with views to the park but is less emphatic as a compositional system.

The structure of visual relations

The visibility structure is compatible with the conceptual strategies in both buildings, illustrating clearly their conceptual and spatial contrasts (see Figure 7.10a–c). In the Museum of Scotland the most integrated areas are found inside the main gallery hall on the first floor and in the atrium (Figure 7.10a, b). The distribution of integration highlights the axial system of views but very few of these axes can be traversed through movement. In the Burrell integration is primarily spread along the northern boundary (Figure 7.10c). But it is also distributed along the other outer edges and

on the intersection of axes, highlighting the grid-like nature of the plan as in an urban space. Benson and Forsyth create a distinction between an integrated inner core and the segregated galleries at the periphery of the building. The architects of the Burrell use exactly the opposite logic. They differentiate between an integrated perimeter, and a set of less integrated gallery bays alternating with integrated axial routes at the centre of the layout. The Museum of Scotland is primarily revealed from the exhibition areas and the atrium at the centre of the layout. In contrast, the Burrell becomes known through the perimeter and the grid-like structure of routes emphasizing large-scale movement.

By anchoring the syntactic centrality on the conceptual centrality Benson and Forsyth assert the role of the inner galleries and the atrium as the compositional and experiential centres. By distributing integration along the perimeter and at the nodal points of circulation, the architects of the Burrell reinforce the idea of the 'walk in the woods', creating a 'dispersed' building. The Museum of Scotland looks inwardly, expressing the notion of a unified and defensive interior. The Burrell looks out into the park, making the natural scenery the pervasive characteristic of spatial experience.

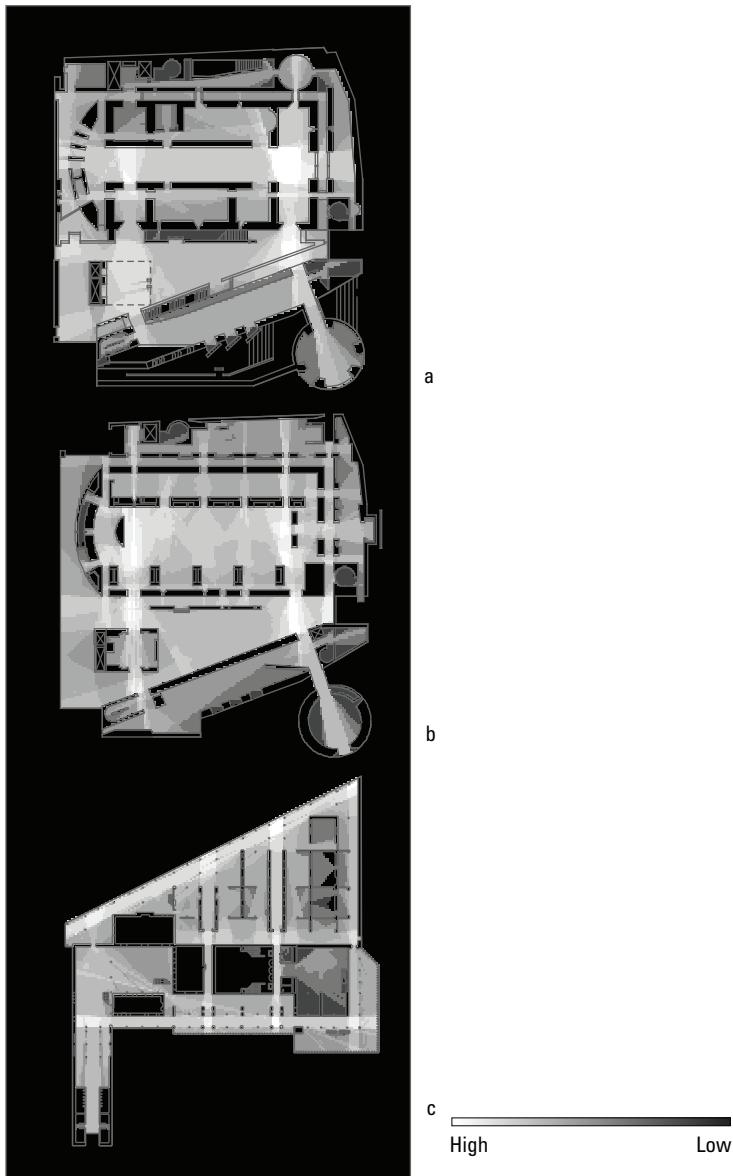
From the perimeter walks the Burrell 'opens' its walls to the woodland. From the exhibition spaces it offers views to the park, but also private viewing conditions protected from large-scale movement. The viewers in the Museum of Scotland also have many opportunities to engage privately with the exhibits. But the spatial and visual complexity of the building causes their attention to oscillate between the qualities of the displays and those of spatial experience. The Burrell offers surprises to its visitors, stimulating their senses through the juxtaposition of the grove with the art objects. But in comparison to the Museum of Scotland, it is experienced as a withdrawn and dispassionate building. In the former the dramatic contrasts between darkness and light, solids and voids, inside and outside construct a spectacular theatre. In the latter the horizontal extension of space, the northern exposure to light, and the calmness of nature evoke the idea of the museum as a garden-retreat.

Architecture and the curatorial strategy

The large sequence

I will now move to the relationship between the spatial characteristics and the curatorial design. I will begin by looking at the pattern of routes, firstly through the large sequence and secondly through the rings of circulation. The competition brief in the Museum of Scotland specified that:

The display concept emerging from this work envisages that core displays, occurring in about three-quarters of the space, should provide a coherent story from the earliest geological times to the present day; however, the galleries should be organised so that visitors can move into, or out of, the sequence rather than having to follow a continuous progression from beginning to end.⁶



7.10
Museum of
Scotland,
Edinburgh.

(a) Visual integration on ground floor.

(b) Visual integration on first floor. The most integrated areas are concentrated in the atrium and the central gallery section.

(c) Burrell Museum, Glasgow, visual integration is distributed along the perimeter and the cross routes linking the north with the south side of the building. Unlike the Museum of Scotland where integration is found at the centre of the layout, the Burrell Museum is revealed to the visitors sequentially through the structure of routes.

The organization of routes and the distribution of the collections follow the requirements of the brief, offering a sequence that is dissected by alternative pathways on each level. The visitors can start from any point and explore the displays, moving backwards or forwards in time, trying alternative paths and viewing sequences. However, the dramatic vertical sculpturing of the building and the top-lit shafts arouse curiosity, attracting the visitors from the inner tower to the perimeter galleries and back again on each floor, completing the perimeter sequence. In addition, the museum guide suggests a journey based on historical progression,

and the display is organized historically from the pre-historic period on the basement to the twentieth century at the top level. Scotland's landscape, the Celts and the Romans are placed in the underground galleries, the emergence of the nation until 1707 is found on the ground floor, displays from the eighteenth and nineteenth centuries are situated on the first floor, the mezzanine and the second floor, and finally a collection of contemporary objects nominated by the public is exhibited at the final level.

Starting from Scotland's geological and archaeological beginnings, the exhibition content in the basement is expressed through the sculptural treatment of the building and the metaphor of excavation. The triangular thrust of the atrium floating away from the light washed walls conveys the idea of early history as a remote past revealed by sculpting the earth's surface. On the ground floor the perimeter sequence takes the visitors from the artificially lit inner galleries to the day-lit peripheral spaces signifying the transition from the old Kingdom of the Scots to the Reformation (MacMillan 1999: 117). The transition from the ground floor to the top-lit central hall on the upper levels communicates the transformation of Scotland from a medieval to a modern industrial society. The passage from these floors to the roof garden is characterized by a similar principle. The roof terrace offers views from the Castle Rock to the wider extent of the city and the landscape, 'the man-made world framed by nature' (1999: 119). The ascent from pre-history to the panoramic views over Edinburgh is symbolic of historic progression from the past into the present and future. At the same time the stratified interior from the geological exhibition in the basement to the views of the city sculpted on the sedimentary rocks reveals nature as a main force, and Scotland's landscape as the central factor in the story (Allan 1999: 127). The relationship between natural and constructed, the city and its artefacts articulate the idea of the 'progressive' forces shaping history and the human agency shaping nature.

In the Burrell nature does not constitute a climax of the large route but a pervasive presence. Instead of a dramatic rise to the roof the Burrell offers an ancient model of locating art in the garden and using nature as the visual boundary. The collection starts from ancient Egypt and Greece at the north-west side, moving to Oriental and Medieval European art at the central and north section of the building, Islamic art and stained glass at the east end of the layout and finally to furniture at the south side. Three tapestry galleries are connected in sequence at the deepest part of the gallery section, while a fine collection of paintings is situated at the mezzanine level.

Studying the ordering of knowledge in this museum, Marcus and Cameron analyzed the schedule of accommodation for the competition. They explain that the collection was divided by region like 'European' or 'Far Eastern', while the European collection was arranged by period (for example '1400–1600'). 'Each of these was further subdivided into type of object – painting, sculpture, tapestry, glass, silver, furniture and so forth' (2002: 53, Marcus 1993: 20).

The consequences of the classification in the schedule of accommodation were the creating of separate spaces for each of the labelled sections,

subsections, etc. Within these spaces are located the group of objects judged to share essential characteristics. Moreover the adjacency of the spaces follows approximately the sequence in the schedule, although the visitor is not necessarily relatively shallow, with many rings – which give the opportunity for alternative routes, short cuts and complete omission (2002: 53).

If the arrangement of objects according to period and region in the schedule was translated into a pattern of spatial adjacencies, the perimeter route is a translation of the classification expressed as a linear sequence in the text into a spatial sequence in the building. This sequence is broadly geographical and historical, moving clockwise from ancient Egypt to the Medieval and Renaissance period. But it is also intercepted by Oriental and Islamic art at the centre and the eastern parts of the layout. In addition, the long vista at the northern gallery section synchronizes different historical periods and geographical regions. Objects are set on a grid of pedestals in a way that they become interchangeable and simultaneously visible. So, the perimeter route and the synchronic visibility in the large gallery section challenge the classifications established by the curatorial interpretation and unify the collection through a peripatetic experience.

An essential condition of the visiting sequence is Burrell the collector. The three Hutton rooms and the courtyard controlling the large route are accessed first, prior to visiting the exhibits, while the south set of spaces is seen last, bringing visitors back to the departure point and staging the visit. So, Burrell mediates the relationship between entering and leaving, the viewer and the displays. The courtyard and the three rooms establish a dialogue between the donor and the collection. 'Here visitors speak in awed whispers' (Marcus 1993: 20). The message the building conveys is that it is the donor who enables this journey through art to become possible. As Marcus suggests, the Burrell celebrates Burrell as a person, his generosity, taste for art, and wealth, becoming 'a modern reproduction of his house' (Marcus 1993: 212). But leaving Burrell's home behind, visitors can step out of the large route and wander in the galleries in no particular sequence. As there is no connection between the courtyard and the rest of the galleries the symbolic expression of Burrell's identity is limited in this space. In the section that follows I will look at how the structure of circulation and visibility in both buildings relate to the exhibition.

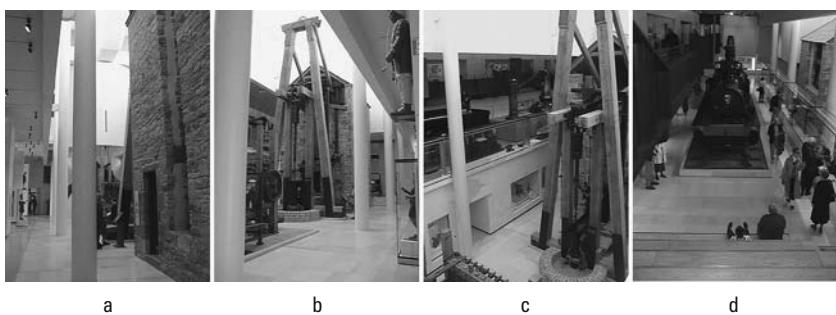
Circulation loops and visibility

Together with the peripheral sequences the architects of both museums offered a large choice of routes and rich visual interconnections that integrate objects across different periods. In the Museum of Scotland the circulation rings and the high levels of visual integration in the inner galleries produce a representation of history as spatial flow between different periods and achievements. The most important expression of history as flow is at the top levels, descriptive of later centuries, through the lofty space overlooked by a cascade of terraces and integrating domestic, social, scientific and engineering displays from the eighteenth and nineteenth centuries (see Figure 7.11a–d). A beam engine, steam boilers, railway engines, locomotives and a

mezzanine made of steel are spatially unified, placing at the core of Scotland's history its industrial tradition (MacMillan 1999: 118, Psarra 2005: 91). Surrounded by the segregating ring of the peripheral galleries the central hall is modelled like a cathedral of the Enlightenment, or a machine hall of the industrial age. The iconic function of this space is strengthened by the correspondence between the geometrical oppositions between centre and periphery, and the syntactic contrast between the integrated core and the segregated perimeter.

In the Burrell, the alternative routes and the rich visual connections add relations to the artwork that 'are both intentional and a surprise'. For the architects they reinforce the idea of the museum being a home for a private collection as well as an exhibition (Gasson 1985: 17). 'Yet the intentions of the brief were that the building should not be an institution but rather a home in scale and in sympathy with the Collection and the environment of the Park' (Gasson 1985: 16). The idea of the museum as a home and as a 'walk in the woods' implies that the architects intended it as a relaxed space, a domesticated setting amid nature. This intention is realized in the linear distribution of integration around the perimeter and the axial avenues that cut through the building.

Referring to the Burrell in *Buildings and Power* Marcus observes: 'Any semblance of a chronological sequence can easily be circumvented, so that the collection asserts that artistic value transcends history' and that 'the traditional curator is left with the problem of how to reassert the importance of period-historical time' (1993: 212). The alternating pattern of European and non-European art along the geometrical bays linked by the large sequence, the synchronic visual relations in the northern section, and the circulation rings favour the aesthetic value of the collection rather than a didactic arrangement into separate areas arranged in historical sequence. Classification categories are placed on a grid of spatial locations. It is possible to imagine different places for objects as the spatial properties allow them to be interchangeable. The artistic value of artwork is reinforced further by the routes terminating on artefacts – which carry no particular significance over other objects in the collection – and punctuated by the Hornby archways at transitional points between gallery sections (see Figure 7.12a). The grid-like placement of objects on pedestals at the north side of the museum adds another homogenizing treatment to the display set in contrast to the irregular clusters of the trees in the woodland (see Figure 7.12b).



7.11
Museum of
Scotland,
Edinburgh. (a–d),
central exhibition
area, 18th and 19th-
century displays.

Space and display: constructing identity

In the Museum of Scotland the chronological arrangement of the display articulates a diachronic view of history as linear progression. At the same time the visual interconnections in the main hall cut a *cross-section* through history, arresting time through a synchronic configuration. Although visitors can explore the collections in multiple ways, the historical sequence, the perambulations of the inner tower, the theatrical visibility of the industrial hall and the historical references create an overpowering message. From the Druidic and Roman times in the basement to the Enlightenment in the inner gallery section, the identity of Scotland is carried through the romanticized notions of the castle and the machine.

The model of the interaction between architecture, nature and the collection in the Burrell originates in the classical villa-garden tradition that opened the walls of the villa and transformed the landscape by a rational grid of axes and measures. But at the same time the viewer is surrounded by echoes of castles, from the Hutton rooms and the carved stones embedded into the walls, to the tapestry exhibition arranged like a medieval hall with armour and weapons. The architecture and the exhibition design call attention to moving and viewing as ordering experience and combine associations of classical order with associations of wilderness from the Gothic tradition. The Burrell puts forward the idea of the garden of history as the eternal place of aesthetic enjoyment and archaeological finds. Closely related to this idea is the tectonic language of the building. '... the timber ceiling [was] a way of making a permanent, very traditional form of construction which perhaps would have a relationship to the collection' (Gasson 1985: 28). Set in the context of nature the timber construction alludes to the 'primitive hut' and the mythical 'origins' of architecture. In clear contrast to the Museum of Scotland and its progress from pre-history to contemporary times the Burrell 'stays still' in mythical time. It is designed as an Arcadian garden in whose avenues the visitors can linger, making comparisons about artwork in a timeless fashion.

In the former the close correspondence between the composition, the structure of visual fields and the display indicates that the building services primarily the semantic curatorial expression. In the latter, with the exception of the collector's identity expressed at the start of the sequence, the matrix of galleries and the non-sequential display foreground the generative function of space and the aesthetic value of objects. In comparison to the Museum of Scotland the Burrell uses architecture theatrically in subtle ways, allowing the interconnected network of space and the natural scenery to set multiple relationships among art objects. That the building should work in this way seems to have been a clear intention on the part of the architects. The idea of 'the walk in the woods' is suggestive of the sense of discovery found in the informality of nature, where everyone can trace his or her path, causing the 'wood' to reveal the potential of multiple routes and connections.

Both museums use architecture and the display to construct romantic expressions of time, history and identity. But while the Museum of Scotland is unable to break free from the clichés of the architectural iconography and the educational message, the Burrell calls them into question by its spatial morphology and the aesthetic juxtapositions. It is no accident that the curators have tried a number of

7.12

Burrell Collection,
Glasgow.
(a) Cross route
gallery.



(b) View to
woodland from
main gallery.



different arrangements of the artwork in the interchangeable matrix of galleries, confirming that the layout can sustain multiple interpretations of Burrell's collection, instead of being consumed by storytelling.

We should open a parenthesis here to explain the limitations in this comparison, and that our interpretation should be seen in the light of the purpose and the collections of the two buildings. The former is charged with presenting the history of Scotland, showing objects of historical significance rather than artistic value. The latter houses one of the most important collections, without a particular story to tell apart from the portrait of the collector and the artistic value of the display. Another difference concerns the size of the museums and the numbers of visitors they admit. The Museum of Scotland is a large building with the task of easing the flow of people through many floors and departments relying thus on the atrium and the central hall to aid orientation. The small size of the Burrell means that it can assist the navigation of visitors through the arrangement of axial routes, avoiding the overpowering impact of a large central space on the experience.

In the section that follows I will attempt to synthesize the study of the four museums examined in the last two chapters. The purpose is to see, first, the similarities and differences in the spatial arrangement of the buildings, and, second, how models of knowledge relate to space in the historical and contemporary cases. Finally, the intention is to explore how the transformation of museums from a simple programme of generating and displaying knowledge to a complex programme of research, education and cultural destination relates to changes characterizing their architecture.

A comparative discussion of the four museums

Looking at the four buildings comparatively, we can rearrange them into two different pairs; the first one uses the spectacular properties of architecture, panoramic surveillance, and an ecclesiastical, historical or industrial iconography to articulate a symbolic message – the Natural History Museum and the Museum of Scotland. The buildings in the second pair – the Kelvingrove and the Burrell Museum – multiply the possibilities of meaning through spatial relations. In the former the conceptual properties and the spatial structure correspond to the hierarchical structuring of the exhibition message. In the latter the geometrical patterns and the multi-connected matrix of spaces construct a polyvalent system where objects and categories of knowledge stand in a series of multiple relations.

It is important to explain that these categorizations are not in absolute opposition to each other. For example, the rear rooms in the Natural History Museum and the galleries in the Museum of Scotland are interconnected, allowing visitors to step in and out of the sequence and try alternative viewing positions. However, a hierarchy of preordained classifications of space and content dominates, creating a narrative coherence, the 'microcosm of nature' in the Natural History Museum, and that of Scottish history in the Museum of Scotland. The Kelvingrove has also superimposed layers of meaning like the symbolic functioning of the central hall appearing to join galleries on the top level that in reality can be accessed through the front and back stairs independently from this space. In the Burrell superimposed

semantic content is found in the area of Burrell's 'home' – the courtyard and the three Hutton rooms – controlling access to the collection. However, in these buildings semantic expression does not command the organization of space, which offers diverse ways to access the galleries and the collections.

Knowledge and narrative

We will now turn to the differences between the two historical and the two contemporary museums in terms of the so-called 'neutral' character of the former and the interaction of architecture with the displays in the latter. It is perhaps interesting to begin this discussion by turning to the Royal Museum of Scotland adjoining the Benson and Forsyth building (Figure 7.3b). Built in 1865 by Francis Fowke, this museum was an example of an organizational schema emphasizing an unbroken relationship between nature, industry and trade. Linked together the two buildings demonstrate the shifts that occurred in museums and exhibitions. The epistemological and social transformations responsible for these changes have been discussed elsewhere and it is beyond the scope of this study to offer an extensive description (Pearce 1999, Roberts 1997). They mainly concern a schism between knowledge and the dissemination of knowledge through interpretation (Peponis and Hedin 1982: 24). In the previous chapter it was explained that as collections grew in size, the encyclopaedic display of artefacts became difficult to maintain and museums started placing only selected objects on display. At the same time their scientific function became gradually separated from their performance as educational places generating a split between the museum as a place for specialists and as a front house for the public (Forgan 1999: 150).

The second crucial transformation in twentieth-century museums concerns a change in the definition of knowledge from 'objective' to being socially constructed (Roberts 1997: 2). The need for museums to address diverse audiences has accelerated this change, generating a concern about how messages should be presented. Instead of promoting a single version of knowledge, specialists accept that there are many different social perspectives. These changes have affected a number of disciplines, shifting the emphasis from 'facts' expressing the ideologies of 'dominant' groups to diverse identities, from colonial to post-colonial history and historiography. These shifts have affected museum theory and practice and are motivated by larger philosophical changes expressed as a reaction to global narrative schemas explaining experience (Lyotard 1984: 4). They reveal a transformation from universal knowledge to diverse cultural meanings, and from knowledge considered in its own terms to knowledge that is inseparable from its social modes of production.

In parallel with these changes there have been shifts in creative disciplines like literature, art and architecture starting with Modernism that challenged the authoritarian formalism of past forms and the single point perspective. In *Ulysses*, for example, Joyce offers an image of the city as a subjective and existential situation viewed from different perspectives (Eco 1989: 10). The representation of the urban experience is generated by the mind of the characters rather than the nature of the urban reality (Alter 2005: 121). The work of Borges is another example that

questions traditional narrative norms that lead to a narrative closure of one message. Movements in art like Cubism emphasized the fragmentation of the pictorial image, implying a variety of viewing positions. Similarly, modern architecture avoided geometric abstractions such as centrality and frontal relations, producing buildings that could not be grasped from static locations. These ideas had an impact on exhibition design with contributions from El Lissitzky, Bayer and Kiesler that integrated space and artwork and adjusted viewpoints, indicating a concern with the ways in which the objects were seen by the viewer (Staniszewski 1998: 4). Bayer's 'diagram of the field of vision', in which a viewer's head is represented by an eye, is the clearest demonstration of an emphasis placed on the impact of space on sensual experience rather than on conceptual properties of the composition (1988: 28).

Set in this context, museums carry the task of presenting knowledge as a social construct. They favour the messages coming out from knowledge over knowledge itself as the object of attention. Architecture enters this context by constructing a variety of spatial experiences that emphasize the perceptual impact of space and the collection. While the historical museums had similar galleries placing everything on display, the contemporary buildings exhibit fewer objects in spaces of varied size, shape, materials and sculptural treatment. While the former vary the section primarily in the area of the main hall, the latter give sectional treatment to spaces in many spatial positions. They offer dramatic views of an excavated basement, a central hall or the landscape. They respond differently to different exposures to daylight and orientation. They contrast the linear extension of axes with gaps, stairs, voids, and objects calling attention to the visual mechanisms governing spaces and the exhibition. All these characteristics provide visual stimuli rather than emphasizing the rational existence of the display and the architecture. So, when these museums are described as 'active containers', in opposition to the 'neutral warehouses' of the past, what is meant is that they demonstrate a greater engagement with perceptual experience than their historical predecessors.

Contemporary museums foreground the perception of the viewer, and the ways in which it unfolds into new and unforeseeable relations. The relativism characterizing their social perspectives matches the experiential character of their buildings, intending to create surprises and encourage sensations. They reinforce the narrative potential of architecture and evoke a range of associations. Perceptual variation tends naturally to the individuation of parts, drawing attention to the local properties of articulation. It is a strong characteristic of twentieth-century buildings, but it is not an entirely new proposition. It has underlined architecture in previous periods and can explain the fascination with ruins in Romanticism, the emphasis on individual freedom in the Picturesque, and the recurrence of this emphasis throughout history. A preference for perceptual variation underlined the reaction to Classicism in Baroque, to the Enlightenment in the Romantic tradition, to the Beaux Arts in Modernism, to Modernism and structuralism in Deconstruction and in parametric surfaces in the 1990s. The more a building attracts attention to the visual dynamics of space and form the more it sees architecture as an affair of perception. It denounces conceptual and semantic unity for perceptual and semantic variation.

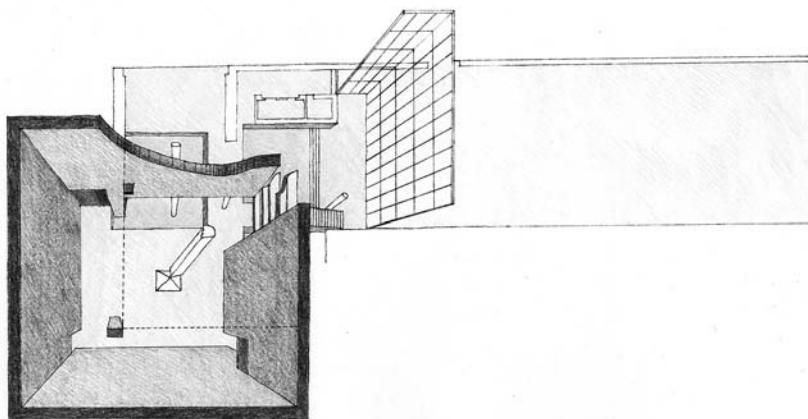
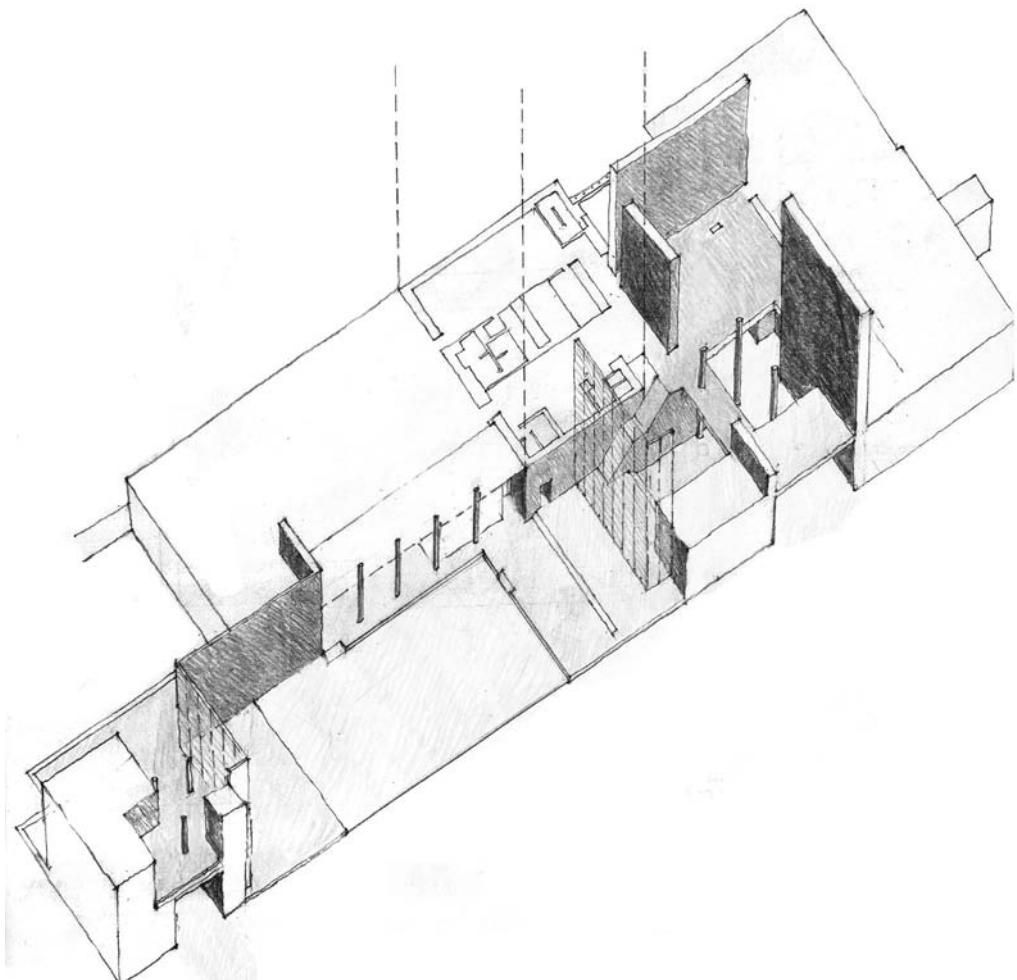
The two buildings that have been examined in this chapter differ from

the Victorian museums in that they foreground – in varying degrees – sensory experience. But within this general tendency they operate in different ways. The Museum of Scotland constructs a strong correspondence between architecture and the display that expresses the symbolic message of the exhibition. But at the same time it has a strong theatrical character ‘framing’ the experience and the collection through layers, voids and a profusion of architectural details. In this way, it superimposes sensual strategies of space on the conceptual message of the building and the display. The Burrell moves in the opposite direction. It uses visual tensions to a lesser extent, allowing the simple ordering of space to guide the visit in a relaxed fashion.

Conclusion

Returning to all four buildings it is interesting to revisit the definitions of nature as a barometer of the ways in which museums employ architecture to articulate their message. In the Natural History Museum nature was seen as a ‘cathedral’ of the divine creation. In the Burrell it is seen as a ‘garden’ of aesthetic pleasure. In the Kelvingrove nature is a resource for culture and industry, and in the Museum of Scotland a source of appropriation by the linear forces of history. Closely related to these concepts is the notion of identity. In the Natural History Museum identity is expressed by the idea of imperial wealth manifested through the encyclopaedic collection. In the Burrell it is associated with the wealth of the collector. In the Kelvingrove it is related to the Scottish educational system, and in the Museum of Scotland to the Scottish industrial development. These ideas reveal a distinction between a hierarchical and a secular interpretation of nature and identity along the notions of ‘cathedral’ and ‘palace’, ‘encyclopaedia’ and ‘machine’, ‘empire’ and ‘garden’.

But it is important to note that the interest in this book is not in uncovering semantic invariants in different buildings, or in showing the universal function of myth in the romantic expression of identity. *The purpose is to reveal how the morphological properties and the exhibition design reinforce these concepts or call them into question.* Equally important is the intention to explore how form, space and the collection cover the conceptual skeleton of these metaphors with different skin and muscles constructing diverse architectural realities. In the Natural History Museum and the Museum of Scotland the geometrical ordering, the organization of space and the display are controlled by a strong system of rules carrying a symbolic message. The Kelvingrove and the Burrell facilitate signification to a certain extent through stereotypical metaphors. But these metaphors do not exhaust the possibilities of interpretation discovered in the buildings themselves, and the ways in which the pattern of spatial relations add multiple meanings to the collections.



8.0
Museum of
Modern Art, New
York (MoMA).
(a) Axonometric
showing main
gallery section
at second floor
(SF USA), the
sculpture garden
and the educational
department,
(b) Atrium.

Chapter 8

Tracing the modern

Space, display and exploration in the Museum of Modern Art, New York

At its meeting of December 8, 1997, the Board of Trustees appointed Yoshio Taniguchi as the architect of an expanded Museum of Modern Art, reconceived to meet the needs of the institution, and its broad public, in the twenty-first century. ... As the Museum began examining its future needs, it quickly realized it required not merely new spaces but fundamentally different spaces from its existing ones. Or, put differently, The Museum of Modern Art could not afford to enlarge itself by simply expanding, as it had done in the past; if it wanted to meet the challenges of the future, it had to create a new Museum, one that could provide the kinds of spaces and spatial relationships that would allow it to realize its intellectual and programmatic goals.

– G. Lowry (1998) in Elderfield, J. (ed.) *Imagining the Future of the Museum of Modern Art*, New York: The Museum of Modern Art,
p. 11.

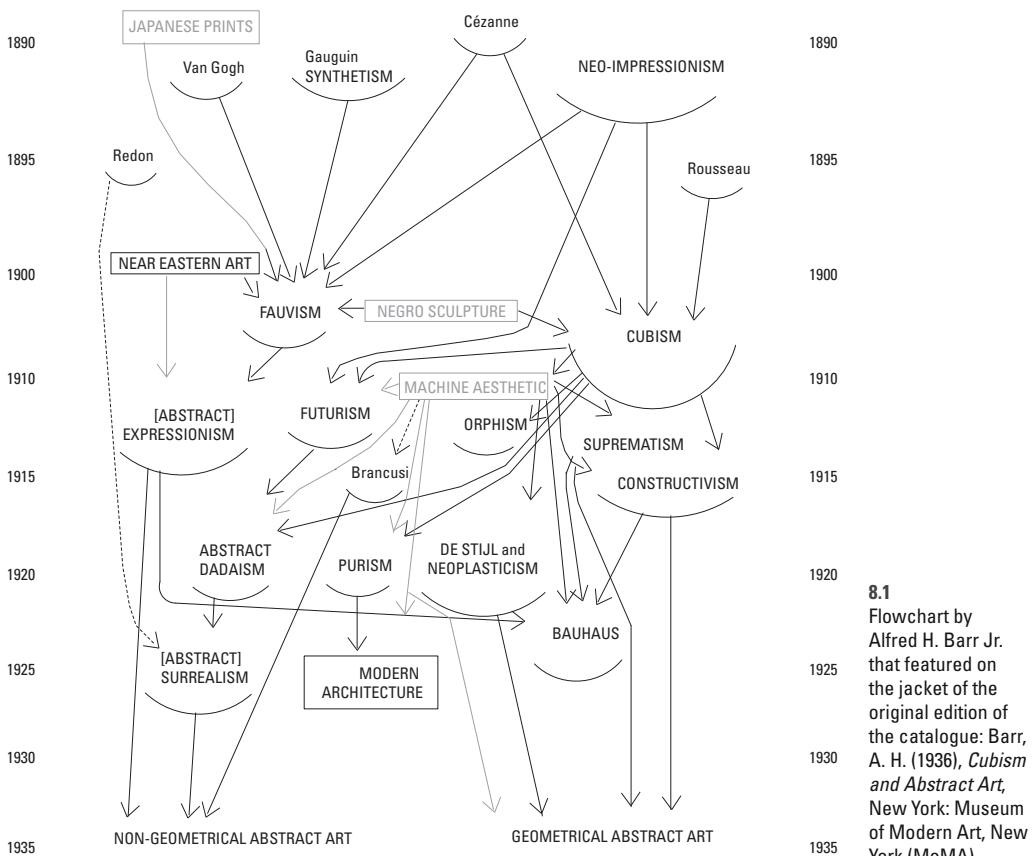
Introduction

No other museum has ever claimed such a comprehensive structuring of a narrative as the Museum of Modern Art in New York (MoMA), or has created such a synoptic collection. The MoMA is associated with the history of modern art in an intimate way, attempting to make order out of the complex relationships among art movements (Lowry 2004: 21).¹ But in the last expansion it tempered the notion of a single coherent story, with the recognition that 'the very idea of modern and contemporary art implies the possibility of multiple, often contradictory, narratives' (1999: 21) (see Figure 8.0a, b). Fundamental in the design brief was the assertion that the galleries should afford the option of a continuous chronological story, as well as of interruptions allowing for alternative readings across history. What makes the study of the museum intriguing is not only its new narrative strategy, but also its new architecture.

Architecture is a catalyst for the museum ... it is not only an object, a shell, a space, an environment in which we articulate a program – it is

also a subject. We collect architecture and design: it is a field of study and anything we build, by definition becomes one of the principal proponents of our larger collection (1998: 30).²

A key figure in the history of the museum is Alfred Barr, the founding director (Kantor 2002: 366). Barr brought a synoptic collection into being, and traced a chronological and genealogical narrative of modern art, consisting of styles and movements, by summarizing artist, movement and time. This narrative was expressed diagrammatically through a flowchart showing complex linkages across styles that progress historically from Cézanne, Gauguin and Van Gogh to Surrealism and the Bauhaus (Figure 8.1). Architecture was included in this classification and was intrinsically interlinked with art currents.³ Together with Hitchcock and Johnson, Barr organized the first architecture exhibition in America with the title *Modern Architecture: International Exhibition*, (1932). In the same year Hitchcock and Johnson published their book *The International Style: Architecture since 1922* (1932).⁴ Barr anticipated the great influence the exhibition had on the architectural world in the opening paragraph of the catalogue: 'Expositions and Exhibitions have



perhaps changed the character of American Architecture of the last forty years more than any other factor'.⁵

Since then the MoMA has staged a series of influential exhibitions including two shows to anticipate the 1964 and 2004 expansions with the title *Toward the 'New' Museum of Modern Art: a Bid for Space* and *Toward the New Museum of Modern Art: Sketchbooks by Ten Architects*. The allusions to Le Corbusier's manifesto of 1923 *Towards a New Architecture* sought to present the charettes, but attempted also 'to situate them within the Museum's extensive architectural history, and affirm its commitment to the rich tradition of modernism' (Lowry 1998b: 17). So, the museum has many interrelated stories to tell: the history of architecture and visual arts in the twentieth and twenty-first centuries and its own institutional history through its extensive commitment to Modernism.⁶

Barr considered that an International Style architect, such as Mies van der Rohe or Le Corbusier, would design the 'ideal' museum exemplifying the spirit of modernity and the institution's own intellectual position (Kantor 2002: 313). Doubling the space of the museum, the latest expansion provided a unique opportunity to restructure the installation and respond to the intellectual spirit of the MoMA. So, the new building begs a number of questions: How does the design of the galleries and the exhibitions address the museum requirement for a primary overview of modern art and for alternative strategies for narration? How do the visitors experience these strategies, and explore the collection? And, finally, how does the new building respond to the intellectual spirit of the MoMA? I will start with the last question, focusing on the architecture and the ways in which it structures experience. Secondly, I will move to the Painting and Sculpture Galleries on the fourth and fifth floors to look at the arrangement of the galleries and the exhibition.

The New Building

The Museum of Modern Art occupies a midtown block in New York City amid other major cultural sites and landmarks. The block is bounded by Fifty-Fourth Street to the north, Fifty-Third Street to the south, Fifth Avenue to the east, and the Avenue of the Americas (Sixth Avenue) to the west. The museum was initially housed within rented accommodation on Fifth Avenue. In 1932 it moved to a townhouse at 11 West Fifty-Third Street. In 1939 Goodwin and Stone built the first building, which has since undergone a history of successive expansions. Philip Johnson enlarged it in the 1950s and 1960s through a series of projects that included the Abby Aldrich Rockefeller sculpture garden. In 1984, Cesar Peli erected the Garden Wing and a residential tower with six of the museum's floors extending beneath it. Taniguchi's scheme marked the museum's seventy-fifth anniversary, integrating all the existing structures and annexes into a unified accommodation. The new complex comprises a new gallery section with a ten-floor tower above it on the west side, the renovated Woodwin and Stone building, the Johnson building (1964), the new Education and Research Buildings on the north-east corner, and seven floors in Cesar Peli's tower at the centre of the campus. The galleries offer an overview of art across different areas from contemporary art, Prints and Illustrated Books and Media (second floor), to Film, Architecture and Design, Drawings and Photography (third floor), Painting

and Sculpture (fourth and fifth floors), and special exhibitions at the top level (sixth floor and part of the first floor).

Planning the expansion: the architectural and curatorial intent

The museum was studied as part of a research project carried out in 2005.⁷ To understand the curatorial intent we looked at the criteria for the competition. These emphasized a number of key issues, the primary one of which was the urban condition. The new building should become 'a mediating force between the experience of the city and the experience of the Museum' (Riley 1998: 282), possibly developing the north-south axis, and consequently a three-dimensional interaction with the city. Crucial was the idea of a 'heterotopic building' (119) composed of many different parts and the idea of 'reusing or reprogramming the Museum's historical spaces, with their particular character, within the overall reconfiguration of the Museum' (283).⁸ A critical decision was made that 'rather than simply adding on, the Museum was seeking an architect who could transform its campus of buildings and additions into a unified whole' (2005: 38). In relation to the galleries and the arrangement of the collections, it was stressed that 'if the Museum is to fully explore the richness of its collection ... it is going to have to find ways of revealing these different stories while still providing a comprehensive overview of modern art' (Lowry 1998a: 91). The design brief stated that the galleries should be organized according to a *variable* and *fixed* system. The *fixed* galleries should comprise a sequence offering a tour through the entire history based on masterworks since 1880. The *variable* galleries, adjacent to the fixed ones, would present aspects of that history in further detail (Riley 1998: 285). They would provide visitors with 'opportunities to see changing arrangements of other paintings and sculpture – and, at times and in places, of works in all mediums – that complement and inflect the more fixed display' (Elderfield 2004: 56).

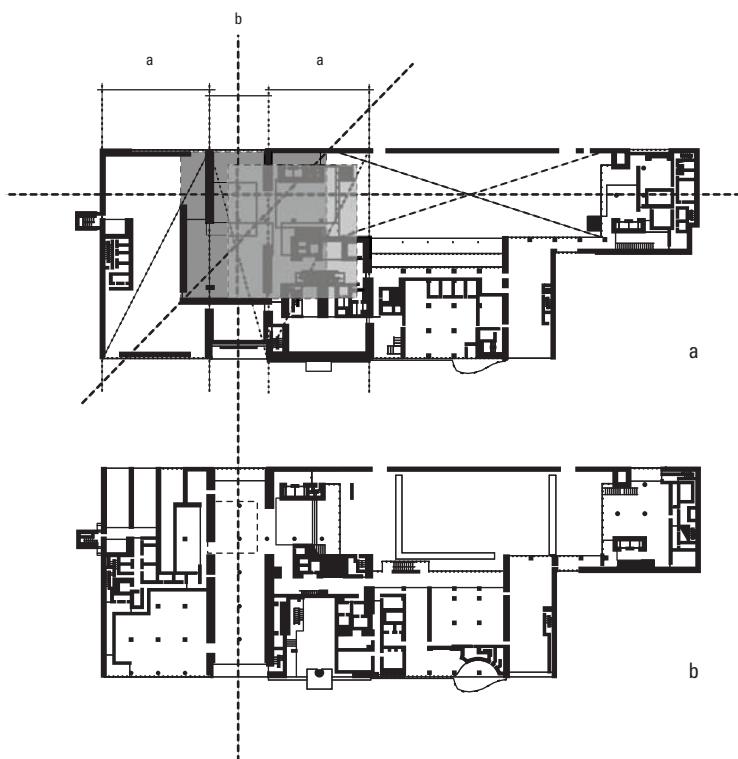
Inherent in these requirements were a number of contradictions. The new museum should be designed so as to have a strong interiority, but it should also identify with Manhattan as an urban condition. It should be a 'cherished sanctuary' and a 'laboratory' for learning (Lowry 1999: 21). It should be committed to history and to the future. It should give a synoptic overview of modern art and alternative opportunities for narration. These paradoxes reflected more general tensions: first, how to deal with Modernism, as a historical movement or as a continuing tradition? And, second, how to combine the study of the past with the 'progressive' aspirations of the institution? So, our purpose is to see how the museum addresses these tensions through the new building and the installation.

The architecture of the museum

Geometry, sequence and visibility

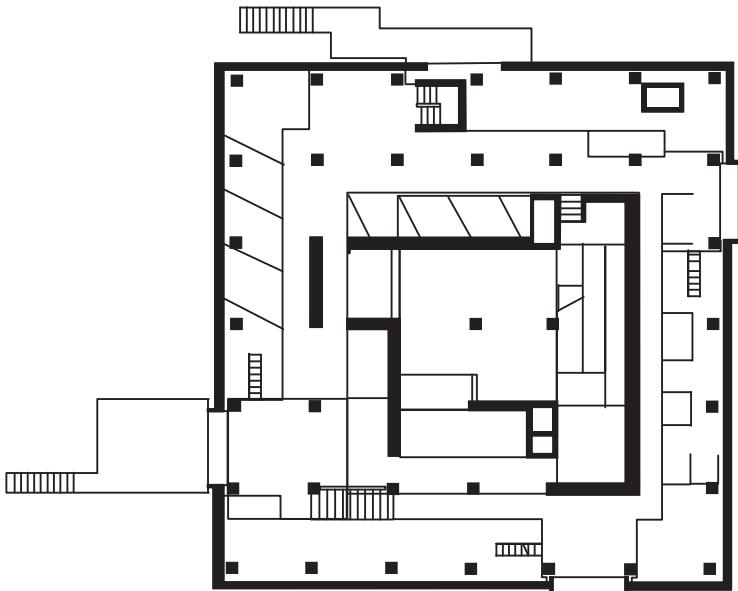
The gallery section has a tripartite composition with the atrium at the centre. But the garden – with the symmetrical arrangement of the two portico-volumes on either side, and the longitudinal axis of symmetry – introduces a second centre in the design (see Figures 8.0a, 8.2). Accessing the exhibitions through the second floor is another

8.2
Museum of Modern
Art, New York
(MoMA). Plans
(a) First floor (FF
USA).



(b) Second floor (SF
USA).

8.3
Le Corbusier, Tokyo
Museum.





a

b

c

classical idea, a kind of *piano nobile* (Lowry 2005b: 31) that led historically to those rooms of the greatest size and finest detail. There are other 'classical' elements like a *loggia* (the double storey space by the garden) and a *portico* (the gallery volume facing the garden). But instead of the classical centrality where the entrance hall, the stairs and the *portico* occupy the axis of symmetry, these elements are arranged along a diagonal line. This line is reinforced further in the interior through a pattern of voids that overlap along its course at multiple heights.

Incorporating decentralizing tendencies within a classical composition Taniguchi reminds us of the critical historicism of Le Corbusier and Mies van der Rohe. Rowe observed that Le Corbusier's Villa Stein was an interpretation of Palladian Classicism, establishing a visual balance between centrality and 'dispersion' (1984: 12). A clear expression of this balance is found in the Tokyo Museum derived from the *Museum of the Unlimited Extension*. Regulated by the Fibonacci series the museum combines a central atrium with a set of peripheral spaces suggesting spatial rotation (see Figure 8.3). The pinwheel arrangement of surfaces and the overlapping voids in Taniguchi's building bring not only the Tokyo Museum but also other critical texts to mind: first, Barr's own comparison of de Stijl with the architecture of Mies in the book that accompanied the *Cubism and Abstract Art* exhibition (1936: 156); and, second, Rowe's and Slutsky's idea of 'phenomenal transparency', which the authors developed by looking at the same Cubist paintings that are displayed on the fifth floor galleries at the MoMA (Rowe 1984: 166).⁹

But while in the Tokyo Museum Le Corbusier screens the central area from the peripheral spaces, Taniguchi allows the centrality of the atrium and its relationship to the outside to be felt from the interior. This is the first space the visitor sees on entering from Fifty-fourth Street crossed by bridges and decks, and punctuated by Barnett Newman's *Broken Obelisk* at the centre (see Figure 8.4a). At the far end of the north-south axis is the entrance on Fifty-Third Street. At a right angle is the double height space with the stairs that lead to the second floor and a large glazed surface facing the garden (Figure 8.4b, c). From this position there are long-reaching views along the vertical and horizontal directions. The convergence of the inner void of the atrium and the outer void of the garden informs visitors they have arrived at the heart of the building and the beginning of the visiting sequence.

Seen from the second floor the atrium is sliced open at the north-east corner, allowing space to flow from the garden to the interior (Figure 8.4d). The gap

8.4

Museum of Modern Art, New York (MoMA). Photo sequence from 44th Street entrance to the sixth floor (SF USA).

From left to right:
(a) View from 44th St. entrance.

(b) View to main stairs and the garden.

(c) View to the garden from the stairs.

(d) View to the atrium from the second floor (SF USA).

(e) View to the atrium from the sixth floor (SF USA).



d

e

is bridged by elevated walkways, distributing movement to the galleries at the north and the south side. From these walkways the visitors can read the vertical layering of the building into three major fields: the entrance hall revealed by a cutting open of the floor, the *piano nobile* and the gallery levels (Figure 8.4e). They can also see, simultaneously, the atrium, the sculpture garden, the educational volume at the far end of the campus, and the neighbouring buildings. The museum is revealed to the viewer like a three-dimensional map apart from the galleries. These are implicitly present through a pair of longitudinal windows adding to the theatricality of the experience.

From the public and private areas the museum offers selective views of the cityscape through large glazed surfaces. But an important part of the spectacle is the visitors crossing the voids, flooding the visible space, framed by the openings looking at art or gazing at the atrium below. From the entrance to the highest level, the visiting sequence celebrates the sensation of looking through a social field based on rich visual relationships and routes that intersect at multiple levels.

To account for the characteristics of the visual fields at the level of the entire building we can look at diagrams of visual integration. These diagrams show that the most integrated areas are situated inside the atrium, stretching diagonally towards the garden (see Figure 8.5a, b). So, apart from channelling movement from the foyer to the exhibition galleries, the atrium attracts movement to itself at the large scale. It shapes the structure of routes and the structure of information determining the overall legibility of the building. Closely related to legibility is the coincidence of the geometrical centre with the distribution of integration, highlighting the atrium and the diagonal link with the city. The new museum conflates the experience of viewing the art with the experience of viewing the architecture and the streetscape. But, most importantly, it creates dynamic social encounters distributing movement throughout the building.

Modernism and the identity of the museum

The visibility diagram of the Tokyo Museum shows that the most integrated locations are found at the corners of the plan. So, the geometrical centre is not the experiential core of the layout (see Figure 8.6).¹⁰ By emptying the centre from integration Le Corbusier dissociates the geometrical concept from the configuration of views and embodied experience. He adopts various geometries, grids, symmetries

and regulating lines, but denies dominance to any of them in terms of shaping perception.

In the three-dimensional realm of the architectural grid, these two conditions have generally oscillated: a traditional humanism, such as that evidenced by Palladio, has taken the grid metaphysically as a fragment of infinity and physically as a container and centralizing property; modernism simply broke this defined oscillation to provoke ambiguity so that, for example, in the case of a composition by Theo van Doesburg, the conceptual grid is both centripetal and centrifugal, the one pointing to the potential of the other (Vidler 1992: 142).

The dual nature of the grid – centripetal and centrifugal – in modern architecture developed from a sense of exhaustion caused by the centralized forms of academic tradition. It grew out of a response to a historical imperative for progress, and an aesthetic preference for a calculated balance between opposite notions. Vidler observes that similar characteristics are found in the work of some post-structuralist architects like Eisenman, who 'felt uncomfortable with the positive versions of architectural origins advanced by the classical tradition from Vitruvius, and refabricated in terms of abstract form by modernism' (1991: 117). But while the



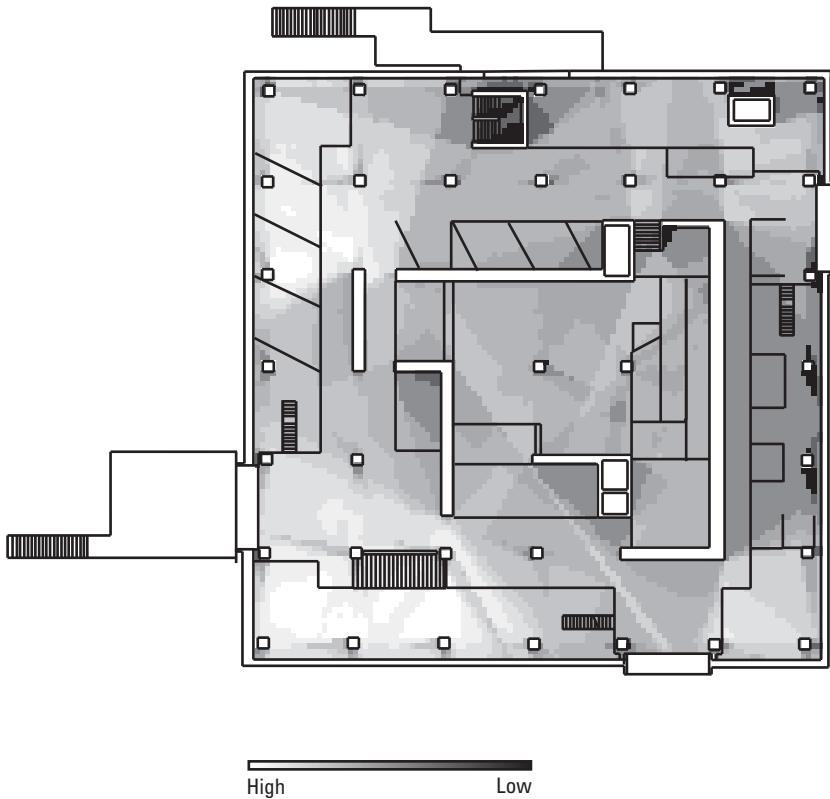
8.5
Museum of Modern Art, New York (MoMA). Visual integration.
(a) First floor (FF USA).
(b) Second floor (SF USA)

Modern movement enabled a clear reading of the conceptual grid, Eisenman's architecture is 'disrupted', using more than one grid system (142). For Vidler, this disruption signifies the ruination of the Modernist grid, refusing the architect's link with the 'monumental duty' of architecture to construct sites of 'institutional occupation' (144).

In contrast to early modern architecture which dissociated geometrical centrality from syntactic centrality based on a preoccupation with progress, and the post-structuralist preference for the fragmentation of modernist concepts, Taniguchi constructs a coincidence between the conceptual and observable properties that reinforces the atrium and diagonal link with the garden. His effort is directed towards establishing legibility and orientating the public around the major spaces on campus and the exhibitions. He satisfies the requirements of the brief and the institutional narrative – asking for an *integration* of the existing structures into a whole – rather than trying to invent a new architectural proposition.

Terence Riley suggests that Taniguchi's use of materials is a calculated response to the notions of contemporary culture and progress (2004: 31). It expresses a 'metaphysical lightness' that is parallel to the shift from a mechanical to a digital period as described by Calvino in his *Six Memos for the Next Millennium*. However, a similar lightness of materials is found in the architecture of Mies and has been associated with the precision of the machine rather than with the digital

8.6
Tokyo Museum,
visual integration.
The central space
is less integrated
than the peripheral
spaces indicating
that geometrical
centrality does not
coincide with the
syntactic centrality
of the visibility
system.



age. It is fair therefore to say that for Taniguchi the expression of progress is of secondary importance. His priority is to give the building those spatial characteristics necessary to construct a rich field of social encounter and informal experience. These characteristics are powerful enough to stimulate new thought about the role of museums in urban contexts and the role of space in generating social co-presence. With the contemporary emphasis on dense cities as the sites of diversity, informality and sustainable living Taniguchi points to the urban grid as a rich network of street life. This kind of grid is entirely different from conceptual grids such as Mondrian's *Broadway Boogie Woogie* – an abstract network of energy that has been paralleled to the streets of New York – or Eisenman's grids of theoretical and symbolic ruination.¹¹ The integration of the building with the city was also a key requirement of the competition brief, and perhaps the most significant contribution of the institution to the debate about architecture and cities in the future.

Wigley suggests that the innovative dimension of the new building can be judged against the contradictory requirements of the trustees, the curators, and the quality of work collected by the museum. But he also explains that 'the best architects not only satisfy the clients' desires but stimulate new desires. Potentials emerge in the collaboration that surprise and intrigue both sides, and further surprises happen in the building itself' (2005: 194). If the innovative intent in architecture and art is to stimulate new thought, the museum should be examined in relation to the curatorial strategy and its capacity to generate new thought through the spatial arrangement of the collection. This brings us to another prerequisite stated in the brief: 'the sequence of spaces from the entry throughout the Museum should be seen as a powerful metaphor for the unfolding narrative of the Museum directly supporting the curatorial message developed in the galleries' (Riley 1998a: 284). To see how the architecture relates to the curatorial message I will look at the spatial organization of the Painting and Sculpture Galleries. This study will allow an evaluation of the innovative dimensions of the building in the light of the larger institutional strategies and the curatorial strategy for the exhibitions.

The 'Painting and Sculpture Galleries'

Views, sequence and visibility structure

The fourth and fifth floor galleries are designed as traditional enfilade rooms arranged around the atrium in a U shape (see Figure 8.7a, b). There is no prescribed path, but the rooms are interconnected, allowing many possible pathways to explore the collections. In addition, there are two entrances on each floor, while halfway along the course is a stairway, so that one can step out of the path and access the other level. However, to complete the visit on each floor in a forward direction, the visitors have to walk through the gallery sequence around the atrium. In comparison with the fifth floor, the fourth level offers fewer detours from the principal course and a longer primary sequence. This is because the axis of entry to gallery 17, exhibiting Pollock, is broken, constructing two more changes in direction along the main route, and a more complex experience (Figure 8.7b).

A second key characteristic is the visual relationship among galleries.

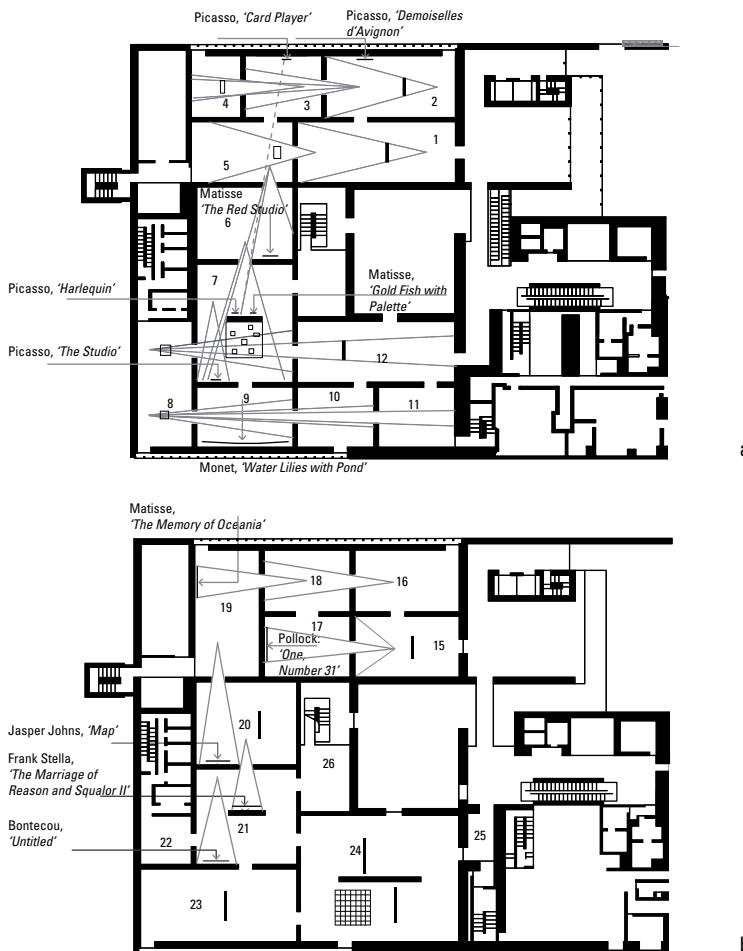
8.7

Museum of Modern Art, New York (MoMA), 'Painting and Sculpture' Galleries, (a) Fifth Floor (FF USA).

(b) Fourth floor (FF USA).

Axial relationship between doorways and paintings.

The axially related thresholds emphasize the painting at the opposite end of the axis. The staggered thresholds (at the centre of the plan) emphasize a frontal relationship with a painting that shifts with the visitor's movement.



The doorways at the north and south part of the plan are axially aligned along the east to west direction. Those at the centre are staggered, creating a progressive change of visual angle (see Figure 8.7a, b). On the fifth floor the shift of angle occurs diagonally from the north to the south-west corner. On the fourth floor the diagonal shifts are oriented in the opposite direction, from the north-west to the south-east part of layout. The central alignment of thresholds allows rooms to be seen frontal, accentuating the works situated at the end of the axis. In contrast, the staggered thresholds accentuate the painting immediately in front of you as you enter, moving the emphasis to a different painting incrementally with your movement. But apart from the axial and the staggered visual relationships, there are diagonal links among doorways, allowing views towards many locations (see Figure 8.10a, b). They create a dense network of multi-directional vistas connecting the main route with the



8.8
Museum of Modern Art, New York (MoMA), Painting and Sculpture Galleries. Visual integration.
(a) Fifth floor with atrium (FF USA).
(b) Fourth floor with atrium.
(c) Fifth floor with atrium (FF USA).
(d) Fourth floor (FF USA) without atrium.

subsidiary galleries. Unlike the axial and staggered links that are formal, the diagonal links are informal, encouraging unexpected visual relations.

The next property to discuss is the visibility structure of the two layouts (see Figure 8.8a-d). The distribution of integration on both floors highlights the diagonal connection of the atrium with the south galleries and the outside, and is similar to the arrangement of integration on the ground and second levels (Figure 8.8a, b). The atrium integrates the visual fields in the public areas of the museum and those in the private areas of the south galleries. In this way, it links the experience of viewing art with the experience of moving and viewing in the whole building. If we exclude the atrium from the analysis to examine the visibility structure inside the galleries only, we see that the fifth floor is integrated around the main sequence linking the atrium, the entry, the exit, the principal route and the peripheral spaces (Figure 8.8c).¹² The fourth level is also integrated along the main sequence with an emphasis on the shift of oblique vistas from the north-west to the south-east side (Figure 8.8d). But the distribution of integration on this floor does not highlight the entire principal route – since the entrance gallery and the rooms adjacent to it are segregated. So, the fifth floor is easy to move through and navigate. Segregation inside the north galleries on the fourth floor indicates that the layout is less legible from this location. The impact of these characteristics on the arrangement of the exhibition and the viewing experience will be discussed later in greater detail.

The display concept: history and placement

The study of the curatorial strategy is inseparable from the history and the precedents that influenced the installation. The intellectual origins of the MoMA are with Alfred Barr, its first director. Barr conceived a comprehensive collection affording a synoptic overview of modern art that influenced criticism in the visual arts in the first half of the twentieth century. Through landmark exhibitions like *Cubism and Abstract Art*, and *Fantastic Art, Dada, Surrealism* in 1936, Barr developed a classification of art movements based on a genealogical formal system that was synchronic and evolutionary in nature (Kantor 2002: xx).¹³

Inclined towards the practice of formal description, Barr proposed – ‘at the risk of grave oversimplification’ – a historical structuring of modern art between 1880 and 1930 into two main currents:

The first and more important current finds its sources in the art and theories of Cézanne and Seurat, passes through the widening streams of Cubism and finds its delta in the various geometrical and Constructivist movements which developed in Russia and Holland ... (1936: 19).

The second current had its starting point in Gauguin, flew through the Fauvism of Matisse to the Abstract Expressionism of Kandinsky, reappearing with Surrealism. The former was ‘intellectual, structural, architectonic, geometrical, rectilinear’. The latter was ‘intuitive’, ‘emotional’, ‘organic or biomorphic’, ‘curvilinear’, ‘decorative’ and ‘romantic’. The first was classical in ‘its austerity and dependence upon logic and calculation’. The second tended towards ‘the mystical’, ‘the spontaneous’ and the ‘irrational’. Drawing from Nietzsche’s oppositions of formal control and primal impulse expressed in the mythological figures of Apollo and Dionysus, Barr further dramatized the contrasts between the two strains: ‘Apollo, Pythagoras and Descartes watch over the Cézanne-Cubist geometrical tradition; Dionysus (an Asiatic god), Plotinus and Rousseau over the Gauguin-Expressionist-non-geometrical line’ (19).

Although divided between objectivity and irrationality Barr’s genealogy acknowledged that the two currents did not follow entirely separate courses but intermingled in some cases in one artist. He also understood that the development of modern art had not a teleological sequential development, but was a complex field of competing forces (Elderfield 2004: 25). Twenty-eight years after the *Cubism and Modern Art* exhibition Barr created the 1964 installation with a view to aiding historical understanding (2004: 47).¹⁴ He installed the collection by stylistic chapters, each usually in a single room, often devoted to one artist, and strung these chapters together in approximate historical sequence. Each room formed an individual unity, while the string allowed for a historical unfolding of different styles. He presented the two streams as two sequences, with Cubism and Abstract Art on the second floor, and Fantastic Art, Dada, Surrealism on the third level (see Figure 8.9a). There were galleries on the perimeter for drawings and prints, photography, architecture and design, and sculpture. In spite of the possible excursions into these rooms, Barr’s historical path was ‘linearly prescribed’ (2004: 48). In addition, the thresholds were staggered, emphasizing a linear flow of history between the room chapters.



8.9
Museum of Modern Art, New York (MoMA). Earlier plans of second and third floor galleries.
(a) 1967.
(b) 1986.
(c) 1996.
The route structure in these layouts was based on a single linear sequence.

These architectural characteristics created what would be termed 'the labyrinth, or beads-on-a-chain, model of installation' (2004: 49).

Rubin's 1984 installation (the second MoMA director) in Peli's expansion also emphasized Barr's two-part story, but through a single sequence, in which 'galleries devoted to the founding Post-Impressionists led first to the rationalist strain of Cubism and abstract art' (Figure 8.9b). Then viewers moved to the irrational stream, exemplified by Expressionism, Dada and Surrealism. The third floor continued with post-war Paris before moving to Abstract Expressionism in New York. To establish the continuity of the historical narrative, Rubin created a series of galleries with uniform architecture and carpeting (51). In a controversial move, he had the collection reframed into simple dark strip frames. However, he interrupted this continuity for the earliest and the most recent parts of the collection. The frames in the nineteenth-century galleries had a 'discreet gold surface'. The most recent galleries (since 1960) had exposed wood floor – to denote a changeable 'gallery' rather than more fixed 'museum' display (51). The collection was laid out in a fuller and more careful way. But it created a maze-like path, without an option to change course, or know where you are in the sequence.

In 1996, Kirk Varnedoe, the third director of the museum, modified the historical collection to reinforce chronological order. For example, he put together Cubism and Expressionism of 1910–13, and placed in immediate juxtaposition works of the same period by Duchamp and De Chirico, Picasso and Boccioni (54). He thus emphasized the complex nature of modern art to make viewers aware of multiple alternatives co-existing in space. Yet, this led to Cubist works of 1910 and 1921 being displayed in separate rooms, sacrificing the internal logic and the clarity

of each style.¹⁵ Elderfield describes Varne doe's approach as 'a chronicle', a record of development at that time, rather than a strict history. This record was telling the story of 'multiple alternatives co-existing (and competing) with each other in a given year' (54). One part of the exhibition was characteristically called *Open Ends*. Yet the linear path through the galleries 'linked each kernel of simultaneous options to the one before and after it', causing them to be seen in sequence (55).

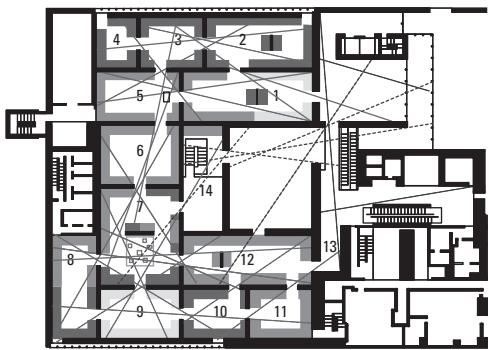
The spatial arrangement of the installation

It becomes clear that the new installation with its combination of 'fixed' core display and 'variable' galleries is grounded in this historic experience. The display is based on subject galleries, similar to Barr's chapter rooms that while not being always strictly devoted to styles are always descriptive of historical periods, a single artist or moment. Most of the galleries span a five to ten year period, each intended to be a complete experience on its own, that is, not dependent on adjacent spaces.¹⁶

The fact, that Cézanne was painted before Picasso was painted, and that Picasso was painted before Mondrian was painted, is not an insignificant fact to know about history, and is one of those things that we pride ourselves on being able to present with a greater density and thoroughness than other museums present it (Varne doe in Elderfield 1998a: 50).¹⁷

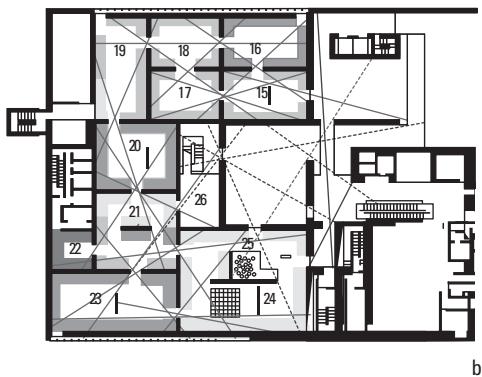
It is clear that historical sequence is of primary importance, and that chronological development carries lesser significance. At the macro scale the development of art moves from 1880 to 1945 on the fifth floor, and from 1945 to 1970 on the fourth floor level. At the micro scale, the chapter-rooms are devoted to paintings from similar periods, but their internal arrangement is not always based on chronological order. As to the chronology of successive galleries, there are cases of temporally co-existing periods, and others where periods overlap, advancing forward in time. So, in terms of the large route covering all rooms from the north-east to the south-east corner, the installation principle shows the development of art as a historical sequence.

To discuss the placement of the collection let us journey through the galleries starting from the fifth floor and descending to the fourth (see Figure 8.10). We enter room 1, where the 'story' begins, the Post-Impressionists. The left and the right wall surface of this room represent the two 'founding fathers', Seurat and Cézanne. The Cézanne line, leads to gallery 2 representing Cubism, while the Seurat course continues with Rousseau, Gauguin, and Van Gogh, the founders of Expressionism. Opposite these painters are the Fauves, Derain and Matisse. Following the principal sequence, we access gallery 5, descriptive of Expressionism and Orphism. This leads to gallery 6 devoted to Matisse, and then to 'Crossroads' (gallery 7), showing works from several artists instead of a single movement, and opening into five adjoining galleries. The final step in the sequence is room 12 displaying Surrealism. This route takes the visitor through major developments, which are mainly close to the expressionist 'intuitionist' stream with the exception of 'Crossroads'. This room intersperses art works from diverse currents, forerunners of the re-emergence of the



1. 'Post-Impressionism'
2. 'Picasso and Cubism'
3. 'Expanding Cubism'
4. 'Futurism'
5. 'Expressionism – Orphism'
6. 'Matisse'
7. 'Crossroads'
8. 'Dada-Constructivism/Suprematism'
9. 'Monet – Landscape'
10. 'Mondrian'
11. 'Realisms'
12. 'Surrealism'
13. 'Hopper – Scheeler'

- From Seurat and Expressionism to Surrealism
- From Cezanne and Cubism to Mondrian
- Cezanne, Seurat (1), Monet – Landscape (9)



15. 'Surrealism in Exile – Early Abstract Expressionism'
16. 'Post-War Figuration'
17. 'Pollock'
18. 'Abstract Expressionism'
19. 'After Abstract Expressionism'
20. 'Johns, Rauschenberg, Twombly'
21. 'Reinventing Abstraction'
22. 'Conceptual Art'
23. 'Pop-Art'
24. 'Minimalism'
25. 'Post-Minimalism'

- Figuration and/or image content
- Painterly Abstraction
- Geometrical Abstraction

two lines in other movements shown in the south galleries.¹⁸ The subsidiary rooms at the north are arranged into three 'chapters', two devoted to the rational course of Cubism (galleries 2, 3) and one to Futurism (gallery 4). The south galleries accommodate exemplars of both streams: Dada (gallery 8) in direct axial relationship with its outgrowth – Surrealism (gallery 12), and Suprematism/Constructivism (gallery 8) in axial relationship with the abstraction of Mondrian and the surrealism-influenced works of 1930s Picasso (gallery 11) (see Figure 8.10 a).

Descending to the fourth floor the visitor moves from pre-war Paris to post-war New York. The display starts with 'Abstract Expressionism', a movement influenced by its European predecessors, by the abstraction and the flat plane of Cubism on the one hand, and the automatism of Surrealism on the other. The four galleries at the north side stage the birth (gallery 15), European currents (gallery 16), and the mature phase of this period through Pollock (gallery 17) and 'Abstract Expressionism' (gallery 18). The rest of the rooms accommodate three strands that were either influenced by, or departed from, or defined themselves in opposition to Abstract Expressionism: 'Post-Abstract Expressionism' (galleries 19, 20, 21, and 22), 'Pop Art' (gallery 23), and 'Minimal – Post-Minimal Art' (galleries 24 and 25) (Figure 8.10b).¹⁹

8.10 Museum of Modern Art, New York (MoMA), Painting and Sculpture Galleries,

(a) Fifth floor (FF USA).
(b) Fourth floor (FF USA)

Visibility lines (axial lines) and distribution of exhibition content (October 2005).

The spatial logic of the installation: the fifth floor galleries

Having described the galleries in terms of broad arrangement of content I will now explore how the conceptual logic of the installation is spatially arranged.

We wish not to lose the sense of the main thread, the sense of a graspable parade of what we feel are some of the greatest achievements of modern art; that there would be some sense of mainstream, but that it would be punctuated, adumbrated, expanded, by a series of alternatives in which one might go into greater depth in a particular period (Varndoe in Elderfield 1998a: 32).²⁰

This statement finds expression in the placement of the objects and their spatial arrangement. Expressionism (galleries 1, 5) and Surrealism (gallery 12) belonging to the 'intuitional' line occupy respectively the beginning and end of the principal route. They guide the experience and advance it forward from the introductory chapter to the closing space. The 'Crossroads' gallery (7) forms an intermission, dwelling on the interconnectedness of currents and forking in a kaleidoscopic way. It serves two purposes: first, by inserting examples of diverse art associated with both the rational and the intuitional currents it fills the essential 'gaps' for the principal route to provide a synoptic overview of the story. Second, by opening in five directions it creates detours and extensions of the synoptic journey. A central island in this room displaying Picasso and Matisse on the north side, and sculptures by Brancusi on its southern side, reinforces its kaleidoscopic nature. Moving around this island the viewers can choose how the main story can transform into other sequences.

While the intuitional course advances along the main route, Cubism, Futurism, Suprematism/Constructivism and the abstraction of Mondrian, all belonging to the analytical rational current, recede into the edges of the layout bracketing the synoptic story. But the southern galleries consist of room chapters that were exemplars of both the analytical and the intuitional line (for example Dada in gallery 8, Mondrian in gallery 10, and 1930s Surrealist Picasso in gallery 11). So, as in 'Crossroads', the classification strategy in this section blurs the distinction between the two lines.

There is a certain hierarchical difference, as the irrational current is visually integrated and controls access to the rational line, which occupies more segregated parts of the plan (Figure 8.8a). However, as the two genealogies intersect interrupting each other, they create an ambivalence regarding their clear-cut classification. Ambiguity is created not only in relation to the two strands but also in relation to individual artists. Matisse, for example, is preceded by two galleries of the principal route at the north and followed by two at the south. He is at the 'centre' of this route – in terms of step depth from the atrium. Sitting between beginning and closure, this gallery implicates the central role of the artist in the development of art, suggesting his influence in both currents (Figure 8.10a).

The unfolding of rooms describes the installation strategy in terms of spatial succession. The axial visual links in the galleries describe it in terms of spatial synchronization. The purpose was to create juxtapositions among adjacent spaces,

what Elderfield calls 'an accumulation of kernels of often different and opposing innovations or propositions that are tied to particular periods of time' (2004: 57). For example, Cubism and Futurism (galleries 2, 3 and 4) are axially aligned, expressing the affinities and contrasts between the two styles. Major works placed on axis highlight these contrasts further. For instance, the statuesque *Boy with Horse* (gallery 2) of Picasso is opposed to the dynamic statue of Boccioni's *Unique Forms of Continuity in Space* (gallery 4). Another example is the axial vista linking Dada and Surrealism in galleries 9 and 13, punctuated by Duchamp's *Bicycle Wheel* – a conceptual composition – and Miró's *Birth of the World*, a surrealist painting emphasizing spontaneity and imagination. In terms of the second axial sequence at the southern part of the layout, this opposes two Suprematist works, Rodchenko's *Composition* (1918) and Clucis' *Maquette for Radio-announcer*, with Picasso's surrealist painting *The Charnel House* (Figure 8.7a).²¹

But while the frontal axes articulate relationships among art works that might be anticipated and predictable, the diagonal ones propose conceptual connections that are more unexpected. The multiple chiastic relationships they construct invite the visitor to discover alternatives coexisting in space instead of didactic arrangements. Objects enter into stable relationships, but they can also be part of an interpretative instability where new relationships are discovered beyond fixed meanings.²² 'In the history of Art,' Barr wrote, 'there are few more entertaining sequences than the influence by way of Holland of a painting of a Spaniard living in Paris upon the plans of a German architect in Berlin' (1936: 156). The multiple visual connections might be thought of as akin to the ways in which artists and art movements in Europe crossed national frontiers and diverse forms of expression.

The frontal and diagonal vistas expose the deepest parts of the layout to a static observer, but the views through the staggered thresholds do not reach the entire length of the plan, stimulating motion. They phase the exploration through focal points, artworks placed at a short distance from the body of the viewers that punctuate the narrative shifting along with their movement. The sequence of these focal points from north to south are Matisse's *Red Studio* (1911) opposite the entrance to his monographic gallery (gallery 6), his *Gold Fish with Palette* (1914) placed side by side with Picasso's *Harlequin* (1915) (gallery 7), and finally Picasso's *Studio* (1927–28) at the south-west corner of gallery 7 (Figure 8.7a).

The central part of the plan unfolds gradually, reinforcing the sense of discovery, inviting the viewers to continue their exploration. Implicated in this journey is the role of the two artists. Picasso is placed at two dead-end spaces, rooms 2 and 12 on the west side, two steps away from the entry and exit, and in gallery 3 at the north part of the layout. His painting *Card player* in gallery 3 is axially connected with *Harlequin* in gallery 7 and Matisse's *The Red Studio* in gallery 6 (Figure 8.7a). So, while Matisse inhabits the centre of the principal route, Picasso drives the second and the penultimate chapters. Then, the two reappear one after the other in rhythmical intervals, and side by side as you traverse the plan from Cubism to Expressionism and to the crosscurrents. Their positioning is guided by overall symmetry in terms of depth from the outside and by rhythm in terms of gradual discovery. These strategies identify the two artists as leading figures in modern art

that carry the story along metonymically, framing it at the boundaries and punctuating it at the centre.²³

Spatially interwoven, the two currents flow through the enfilade of rooms, interrupting each other then assuming their course until the next intermission. The new display strategy questions the old distinctions between opposites like formality and irregularity, idealism and realism, the two-part historical classification and the complex relationships among art works. But it also becomes obvious that it is a spatial reinterpretation of Barr's original classification of modern art into a *synchronic* arrangement and an *evolutionary* sequence – as expressed in the jacket of the exhibition catalogue *Cubism and Modern Art* (Figure 8.1).

It is important to note that the curatorial intent has not indicated a concern with how to restructure Barr's two currents in space. In fact, the intention was to move away from this dialectical argument, suggesting that there are far more complex relationships among art works and movements. However, the placement of works is based on room chapters, artists, movements or periods reinforcing pre-existing classifications. In addition, Barr's genealogical lineage from Expressionism (galleries 1, 5) to Surrealism (gallery 12) is expressed by the position of the former at the beginning, and the latter at the end of the main path. And, finally, the overall presentation of art from entrance to exit reveals itself as a diachronic development based on historical sequence.

The fourth floor galleries

Moving to the fourth floor we find a set of parallels and oppositions presented as 'arguments' and 'counterarguments', like 'painterly abstraction' (an engagement with the physicality of the work) and 'geometrical abstraction' (a reaction to expressionism and to the artists' 'handwriting' by brushwork, or any type of marks on the canvas) – or 'abstraction' (seen as a denial of representation), and 'figurative representation' or 'image content' (Figure 8.10b).

The Post-Abstract Expressionist presentation charts two principal directions. ... The first comprises artists who built on or tempered the painterly abstraction of their predecessors ... and those who transformed its painterliness by infusing it with image content. ... The second direction encompasses a broad group of artists ... revealing crosscurrents that complicate, develop and seek to escape from a dominant style (Elderfield 2004: 297).

These 'arguments' and 'counterarguments' are sometimes seen in room-by-room succession and others in the same gallery in close juxtapositions. Johns and Rauschenberg for example, who reinvented the content of everyday objects, are in gallery 20, followed by gallery 21 ('Reinventing Abstraction') devoted to works that moved away from emblematic representation. Or Frankenthaler and Louis, who opened new possibilities for handling paint, are in the same space with Kelly who 'proposed severe abstract alternatives to painterliness' (gallery 18) (Elderfield 2004: 297). Artwork from diverse 'crosscurrents' is located in gallery 21, as in

'Crossroads' (gallery 7), leading to four other galleries. But each of these directions is conceptually linked with work shown in the middle and south spaces. So, Johns and Rauschenberg, breaking the distinction between art objects and everyday objects, are associated with Pop Art, emphasizing the mass-produced and everyday common values. Fusing the boundaries between the work as art and the work as object, artists like Kelly and Stella, in galleries 18 and 21 respectively, are linked with Minimal and Post-Minimal art, focusing on the reality of the object and its spatial presence. Kelly's modular accumulation of painted canvases in *Colours for a Large Wall* in gallery 19, for example, are connected through the progressive shift of visual angle from north-west to south-east with Andre's *Lead Square* organizing flat modules of lead on the floor of gallery 24.

The positivist assertion of the first decades of the Museum's existence, that modern art forms a single, coherent narrative that can be reflected in the Museum's galleries, needs to be tempered by the recognition that the very ideas of modern and contemporary art imply the possibility of multiple, often contradictory narratives (Lowry 1999: 21).

The discussion of both floors shows that the installation with its combination of fixed and variable galleries is built around this recognition. The spatial mechanisms constructing 'multiple narratives' are grounded in three strategies: first, a main sequence that intersects with secondary galleries generating circuits of movement. Second, exemplars of different art strands separated into different rooms, but also interlaced into one space. Third, open visual relations that integrate these strands from a distance. But as the presentation of the overall development of art is mainly historical based on stylistic chapters, it is the smaller sequences at the northern and southern part of the plans and the visual interconnections among rooms that facilitate the diversion from an established narrative into alternative stories. As suggested earlier, the new installation is still attached to the didactic message of previous exhibitions, but contrasts the strict evolutionary sequence with synchronic visual relations.

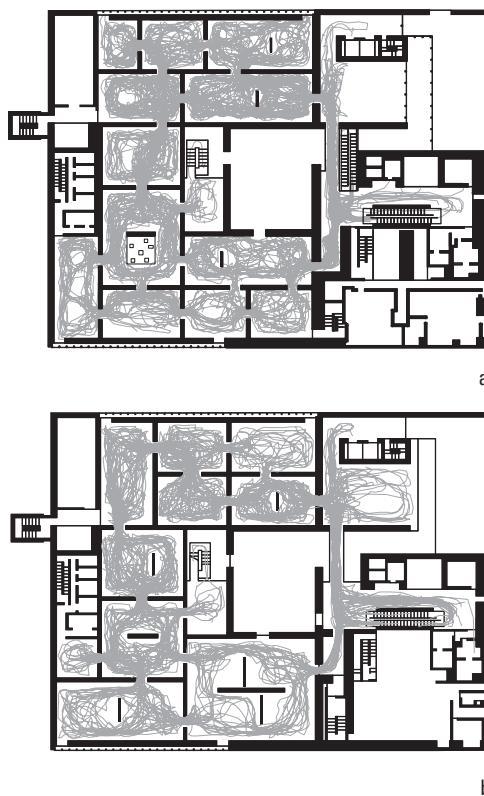
Returning to the comparison between the two floors we observe that in spite of their similarities they have strong differences. There are more circulation loops and opportunities for diversions on the fifth floor than on the fourth level. The entrance gallery on the former is integrated, while the entrance and the north galleries on the latter are segregated (see Figure 8.8c, d). Finally, the main sequence on the fifth floor consists of a smaller number of rooms than the main sequence on the fourth floor. The greater levels of integration on the former create greater levels of interaction among art contents. In contrast, 'Early Abstract Expressionism', 'Post-War Figuration' and 'Abstract Expressionism' on the fourth floor are isolated from the rest of the spaces. The visual isolation of these movements seems appropriate to the viewing conditions essential to appreciate works descriptive of this period. The 'action paintings' of Pollock or the 'colour fields' of Rothko were intended to engulf the viewers, requiring them to submit all faculties of understanding to the large size, boundlessness and multilayered nuances of their canvas. So, these galleries are

meant to absorb the attention of visitors, encouraging focused viewing. This brings us to our next task related to the ways in which people view the collection, which is explored in the following section.

Exploration patterns

By locating objects and people in time as well as in space, the Museum is constantly mapping relationships between works of art and their viewers, so that the space of the Museum becomes a site of narration where many individual stories can be developed and realized (Lowry 1999: 17).

What kinds of narration do the visitors realize with their movement and how do the differences between the two floors affect their exploration and the social character of the visit? To answer these questions the study tracked the routes of 50 visitors on each floor for 20 minutes (see Figure 8.11). Although there is no prescribed way to access the galleries, most visitors enter through the north entrance (70 per cent), seeing the collection in historical sequence.²⁴ In terms of exploration only 50 per cent of the visitors exited from the fifth floor within the observation time, as opposed to 70 per cent that exited from the fourth floor galleries within this period. In addition, there are

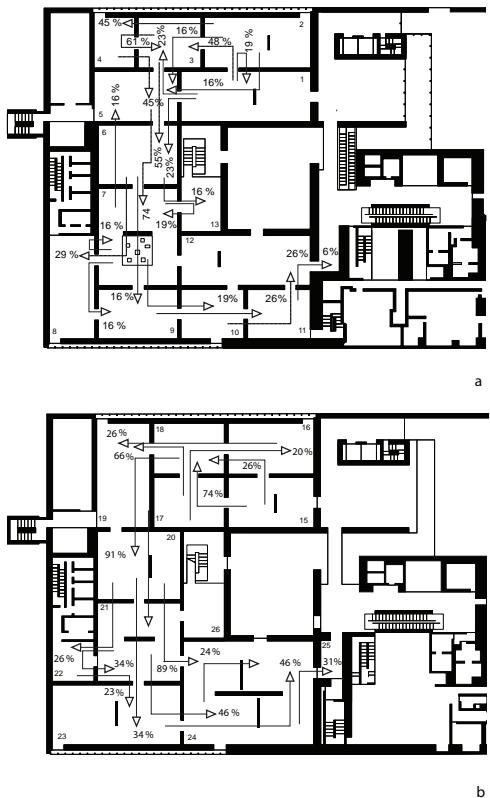


8.11
Museum of Modern Art, New York (MoMA), Painting and Sculpture Galleries. Traces of visitors' paths.
(a) Fifth floor (FF USA).
(b) Fourth floor (FF USA).

greater degrees of variation in paths with regards to the numbers of rooms crossed by each path on the fifth floor than on the fourth level.²⁵ So, visitors stay longer on the fifth floor than on the fourth floor, exploring the layout in more individual ways with respect to each other.

To study the explorative behaviour in detail we converted each path into room sequences in the order in which they were visited. Next we calculated the repeating frequency of sequences, consisting of two rooms and three rooms respectively. This was to identify whether there is a confluence of paths in those galleries that branch into other rooms offering circulation options. We also calculated the repeating times of two-room and three-room sequences expressed as a percentage of the total number of paths (see Figure 8.12).

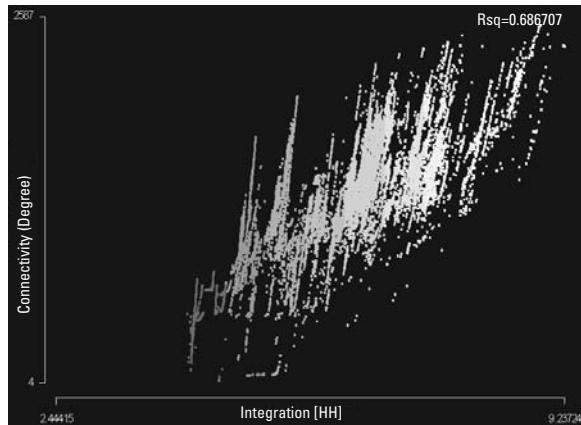
On the fifth floor there is not a prevailing itinerary as visitors distribute equally to gallery 2 and 5 at the north part and to galleries 8, 9 and 12 at the southern part of the layout (Figure 8.12a). On the fourth floor there is less differentiation in the visitors' paths with 74 per cent of the people accessing the galleries at the north in the order of 15-17-18-19. In terms of the south galleries paths divide equally towards galleries 23 and 25 (Figure 8.12b). The time spent on each floor, the degrees of variation in terms of the number of rooms visited, and the path sequences indicate that the visitors are more explorative on the fifth floor than on the fourth level. The intelligibility measures and the spatial characteristics of the two layouts are



8.12
Museum of Modern Art, New York (MoMA), Painting and Sculpture Galleries. Dominant trends in three-room sequences,
(a) Fifth floor (FF USA).
(b) Fourth floor (FF USA).

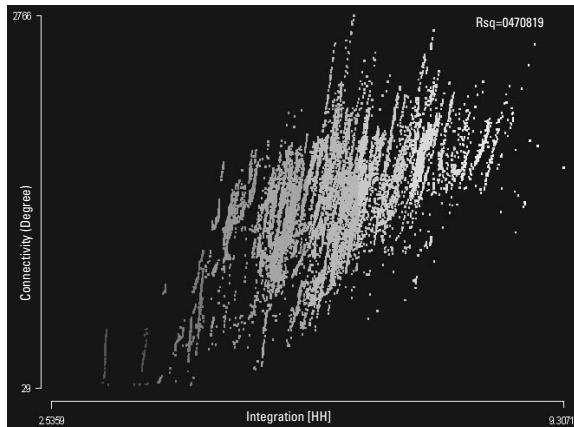
8.13

Correlation of visual integration and connectivity,
(a) Fifth floor (FF USA).



a

(b) Fourth floor, (FF USA).



b

responsible for these behavioural differences (see Figure 8.13a, b). The visitors grasp the fifth floor better than they understand the fourth level, which has an impact on their patterns of choice and exploration. This is confirmed by a significant correlation on the fifth floor between the integration values for each room with the observed flow rates across thresholds ($R^2=0.68$), and a less significant correlation of the same attributes on the fourth level ($R^2=0.47$).

If variation in paths is an indication of variation in the narratives realized with people's movement, then half the visitors on the fifth floor and the southern part of the fourth floor experience different kinds of narration, realizing the museum's intention. Since visitors flow equally into gallery 2 and gallery 5, Cubism and Expressionism–Orphism carry equal weight in initiating the story. The fourth floor

narrative is primarily told through 'Pollock' and 'Abstract Expressionism' with 74 per cent of visitors missing post-war Europe in gallery 16.

If the paths show that visitors do not prioritize any style in terms of spatial sequence, the paintings that attracted the highest viewing rates can help us to see whether they prioritize any paintings in terms of the narrative message. With the exception of Picasso's *Les Demoiselles d'Avignon* (gallery 2) and Monet's *Water Lily Pond* (gallery 9), the works that attracted the highest numbers of stops are primarily situated along the main sequence (Figure 8.7a). A strong correlation between visual integration and the average number of visitors that stop to view each painting in each room on this floor ($R^2=0.72$) confirms that the spatial and curatorial strategies highlight the 'intuitional' line and its major role in communicating the pedagogical message.²⁶ On the fourth floor most of the paintings that attract the highest rate of stops are also situated on the main sequence, with the exception of three paintings in gallery 23 descriptive of Pop Art. However, there is not a significant correlation between the structure of visual fields and the viewing rates.

The differences between the two layouts indicate that on the fifth floor there are greater levels of exploration than those observed on the fourth floor. However, the viewing rates suggest that at the level of engagement with art the multiplicity of meanings that are available is not fully exploited, as visitors' attention is attracted to paintings situated along the main sequence. So, the display strategy reveals an ambiguity reflecting the inherent paradoxes in the museum to provide both a synoptic overview of modern art and alternative strategies for exploration.

Architecture and the curatorial message

In comparison to the fourth floor, which presents post-war art as a linear development, the narrative on the fifth level constructs a message of pre-war art as multi-dimensional and interconnected. There is a wide belief that the reformulation of pictorial space in the early twentieth century resulted in immense diversity, but also in an underlying set of shared values, for which the interactive nature of the Bauhaus served for the MoMA as the ideal model.²⁷ On the other hand, post-war art carried greater levels of individuality and a proliferation of ways to challenge inherited social, political or aesthetic content, including the nature of art itself, its mechanisms, materials, representations, its viewing conditions and products. The visual integration on the fifth floor promotes the idea that in the first part of the twentieth century art was subject to an interactive process. In contrast, the weaker levels of integration on the fourth floor imply that post-war art dwells on individual artists or schools strung in a sequence of actions and counter-actions.

The MoMA is often defined as a 'laboratory' or a place of intellectual intensity willing to take risks and favour controversy (Lowry 1999: 17). Returning to the requirement in the brief that the experience of the building should be a metaphor for the museum as a whole, and for the narrative message in the galleries, it can be proposed that the identity the MoMA projects is close to the visual interconnectedness on the fifth floor, or the Bauhaus model. This is because the visual relations in the atrium and the way it is integrated with the galleries advance the idea of the museum as a dynamic field of intersecting routes and departments. This observa-

tion brings us back to the question: How has the MoMA used architecture and the display to reconcile the notion of a 'progressive' institution modelled after the spirit of Modernism, which in many ways is considered as a historical movement? If the Bauhaus is a metaphor for an idealistic museum, the Manhattan streetscape offers a transfiguration of this metaphor from a historical to a contemporary context. The synthesis of the Bauhaus and the Manhattan models is what enables the MoMA to express the underlying contradictions in the institution, devoted to the established and the experimental, the predictable and the unforeseeable, and to modern art as history and as a living condition.

The didactic and explorative mode of installation

The study of the MoMA showed that contrasts such as classical and romantic, regular and irregular, intellectual and sensual are implicated in the theories of modern art that influenced the history of the museum and the installation. The analysis of the galleries suggests that the new display concept questions this dialectic, encouraging multiple relations among paintings and sculptures. But it also shows that the new installation is a spatial reinterpretation of Barr's classification of modern art into a *synchronic* arrangement and an *evolutionary* sequence. As it turns out the museum's 'progressive' identity in the new building is a matter of historic reinterpretation rather than radical reformation.

At the level of the architecture as a whole the design responds successfully to all requirements in the brief and the institutional narrative, but does not take the risk of a radical architecture. However, the strong connection of the building with the city defines a significant contribution to the debate about urbanism and its relationship to major cultural sites. It renders the experience of the museum as a field of social co-presence with the potential to produce unexpected social encounters. The 'progressive' intentions of the institution are in this way manifested in the generation of an informal spatial setting.

Returning to the MoMA's strategy for the new installation, it is interesting to review a number of observations on the role and function of exhibitions. In her study of the placement of objects in museums and galleries Victoria Newhouse suggests that exhibitions can be educational, characterized by a single overriding idea, or aesthetic, promoting juxtapositions of objects subject to highly personal interpretations (2005: 211). Closely related to this proposition is Serota's distinction between 'interpretation' and 'experience'. The former organizes works of art according to relationships and sequences to illustrate a story. The latter 'undermines the traditional priority given to the curator as the person who exercises discriminating judgment over selection and display in the museum' (2000: 15). In a specific response to Serota, Elderfield explains that the dilemma of a didactic versus an aesthetic installation is a 'false dichotomy' since understanding art and enjoying art are inseparable from each other (2000: 46). However, the pleasures of understanding are quite different from the enjoyment of those aspects we do not understand because they are unforeseeable or unknown. These aspects satisfy our desire to be intrigued and surprised while also leading potentially to new knowledge. The historical development of art based on stylistic groupings, and the unexpected visual juxtapositions in the

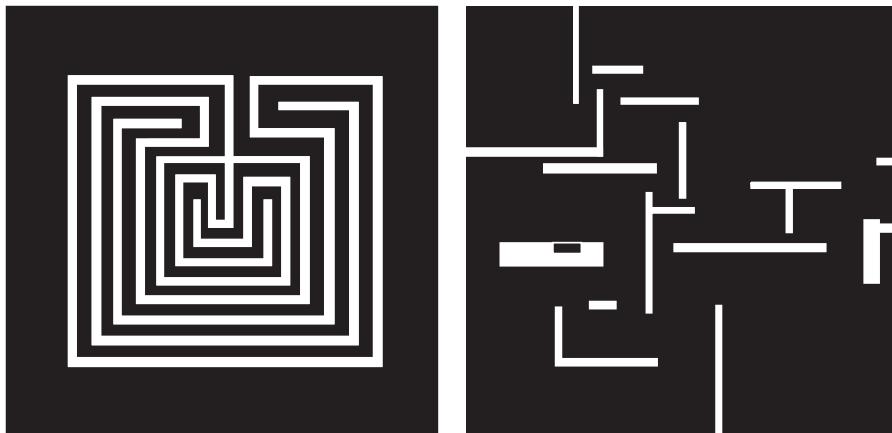
galleries, indicate that the new installation at the MoMA is ambiguously positioned between the educational and the aesthetic mode of exhibition.

Conclusion

Underlying the dilemma of the didactic and the aesthetic mode is the factor of space. Newhouse suggests that exhibition designers are like cinematographers. 'The impact of the artist depends on the team guided by the curator. Like film directors exhibition designers are concerned with style, technology and message' (2005: 142). The close integration of the spatial structure of the galleries with the spatial structure of the entire building and the spatial strategies of the display at the MoMA suggest that the impact of the artist depends also on the collaboration between the architect and the curator. In fact, as the analysis in the third part of the book shows, museums share a framework of formal and spatial characteristics, which are combined in different ways to structure the visit and the design of exhibitions. There are buildings like the Natural History Museum, the Museum of Scotland, and to a certain extent the MoMA that use space to service a didactic narrative. On the other hand, there are museums like the Kelvingrove and the Burrell which use the spatial relations and a relaxed arrangement of exhibition material to generate a rich spatial and aesthetic experience.

Part Four

Theoretical Synthesis



9.0
Cretan labyrinth
(left). Mies van der
Rohe, Brick Country
House (right).

Chapter 9

Comparative discussion

The nature of the Labyrinth is such that it entertains dreams that include the dream of the Pyramid.

– Tschumi, B. (1999), *Architecture and Disjunction*, Cambridge, Mass.: The MIT Press, p. 49.

Introduction

In this chapter I address the fundamental considerations underlying the analysis of the buildings and texts in the book. In all of the cases I discussed, the approach developed along two complementary strands; on one side, the description of architecture through conceptual patterns according to which one can draw diagrams and demonstrate relationships; on the other, space experienced as an entity that changes continuously with our movement. Underlying this investigation was the question of meaning; how architecture becomes meaningful as conceptual and perceptual space, and how the cultural dimensions of buildings relate to these types of space. In this chapter I attempt to synthesize the main observations made through the analysis of individual buildings. I will also discuss theoretical accounts, addressing similar questions so as to locate the subject of this work in a historical and theoretical context. But before entering the discussion of theories and the comparative synthesis let me review the main ideas emerging from each chapter.

Review of buildings

In the first chapter we saw that the Parthenon is characterized by a conceptual unity and a spatial organization that controls access from the exterior to the interior in a linear sequence (Figure 1.4). In contrast, the Erechtheion consists of a set of interconnected sequences and is not described by a single geometrical concept (Figure 1.6). The morphological ordering of the Parthenon corresponds to the hierarchical structuring of the sculptural narrative expressing the political power of Athens. In contrast, in the Erechtheion there is no correspondence between the spatial morphology and the cultural content, which is based on a wide range of archaic myths of local significance. Each of these myths is associated with a particular space rather than being consolidated into a top-down narrative and an overall morphological schema.

In the analysis of the Barcelona Pavilion I argued that it is characterized by a geometric co-ordination of elements that is hidden behind the overall asymmetrical appearance of the building (Figure 2.4). The contrast between symmetry and

asymmetry is accentuated by the use of reflective materials that raise symmetry to the level of visual experience. In addition, the surfaces of the Pavilion are diagonally aligned to control the visual fields, and enable the viewer to perceive the limits of space. As for the reflections, they decompose the building but also allow the interior to be perceived as a unified whole (Figure 2.12a–d). In comparison to the other buildings discussed in this book, the Pavilion is a unique case, having no programme of activity. But the diverse scholarship that has been carried out on the building suggests that it evokes diverse typologies carrying varied expressions of meaning. We saw that its properties and visual fields draw attention to themselves and to the ways in which they influence our perception. So, it is possible to argue that aside from typological allusion, rich meanings in the Pavilion arise through contrasts embedded in its spatial relations and optical experience.

Discussing Borges' fictions, I identified a tension between the narrative structure and the narrative sequence, or the conceptual ordering of the story and the temporal unfolding of narration. More precisely, it is suggested that the gradual recounting of events in the text is opposed to the conceptual links among narrative elements based on geometrical relations (Figures 3.3, 4.10). Co-ordinating things over and above their positions in the sequential order of language, Borges multiplies the potential for their interconnections. This characteristic challenges the idea of fiction as a forward march with the notion of narrative as a potential domain for unforeseen outcomes, new narratives and associations.

In the chapter dedicated to the Soane's Museum I argued that it is composed as interplay between axiality, centrality and the decomposition of these properties into many axes and centres (Figure 5.4). It is also suggested that it has high levels of visual integration that contrast with the spatial itinerary based on a large circuit of movement. The visual organization allows the house to be seen in its entirety through minimum changes in direction (Figure 5.9). The circuit, on the other hand, directs the visitor to see the house in a sequential order (Figure 5.6). These attributes juxtapose spatial synchronization with peripatetic experience, the appreciation of each room individually with the comprehension of visual relationships among many spaces in the building. The mirrors in the Museum reinforce these characteristics, reflecting many different views and spatial relations. Finally, the collection is arranged according to Soane's personal narratives or 'studies of his mind'. In contrast with some of the museums which were to follow, it avoids historical taxonomies to foreground the aesthetic significance of artefacts and their combinations.

Discussing the Natural History Museum and the Kelvingrove I showed that the former is composed of bilateral symmetry, a single staircase, and spatial depth with galleries arranged in hierarchical sequence from the entrance (Figures 6.4a, b, 6.5 and 6.6). Kelvingrove is less hierarchical, consisting of a two-part geometrical symmetry, two entrances, six staircases and an interconnected matrix of gallery spaces. In the Natural History Museum the strong geometrical structure and the rigid spatial system were exploited to classify specimens into separate spaces. In complete contrast to this, in the Kelvingrove the interconnected set of galleries generated a rich pattern of relations among diverse disciplines. In the former the morphological rules were used to express the organization of knowledge through

the scientific theory of classification, and the imperial encyclopaedic collection. The latter was symptomatic of a Scottish Victorian agenda, promoting knowledge as an integral part of social practices such as industry and trade.

In the sixth chapter I analyzed the Museum of Scotland, identifying a dialogue between the centre and the edges of the plan based on the formal strategy of layering. This dialogue is made more powerful by the structure of visibility, creating a distinction between high levels of visual integration at the heart of the gallery core, and segregation at the periphery of the building (Figures 7.10a–c). In the Burrell the grid-like arrangement of the layout is equivalent to the grid-like distribution of integration along the outer boundary and the arteries of circulation. In the former the placement of the exhibits follows a historical sequence from the basement to the top levels, signifying the transformation of Scotland from a medieval to an industrial nation. In the latter there is no overall story to tell in the area of the art galleries beyond the value invested in the collection and the story of the collector at the start of the visit. The properties of layering and vertical excavation in the Benson and Forsyth building are manipulated to express the semantic structure of the collection. Rather than using space to reinforce the conceptual arrangement of the exhibits, the architects and the curators in the Burrell allow space to generate multiple relations among objects.

Finally, the Museum of Modern Art in New York has one centrality composed around the atrium and another one around the sculpture garden (Figure 8.2). There is also a correspondence between the atrium as the geometrical centre of the gallery section and as the place of integration. The distribution of visual integration constructs a rich pattern of social co-presence that links the entrance foyer, the atrium, the gallery rooms and the outside. In this way, the capacity of the public spaces of the museum to generate a rich pattern of social encounters is related to the city and its potential to construct un-programmed social relations. In terms of the ‘Painting and Sculpture Galleries’ on the fourth and fifth floors, a shift was observed from the strict spatial sequence of previous installations to the intersection of a large loop with smaller rings of circulation. A pattern of visual interconnections among gallery spaces was also identified. The display adheres to Barr’s interpretation of early modern art based on stylistic chapters, each in a separate room, and as evolutionary sequence of two main strands – a ‘rational’ one descending from Cezanne and an ‘irrational’ strand stemming from Fauvism. However, the visual interconnections among galleries blur the strict categorization of art into two distinct currents.

The next task is to look at these buildings comparatively and try to answer the following questions: how can we describe the interface between the conceptual strategies, perceptual experience and cultural meaning in these works? We can start by observing certain morphological consistencies across the examples. On the one hand, there are buildings that subject geometry, the visual relations of the interior and their cultural content to an overall conceptual idea such as axiality or centrality, like the Natural History Museum and the Museum of Scotland. On the other, there are examples that bring into play a variety of local rules, rather than a single overall schema like the Barcelona Pavilion, the Soane’s Museum, and the Burrell. Finally, there are hybrid cases like the Kelvingrove and the MoMA. The Kelvingrove appears

at first to be strongly structured and overly symmetrical, but the two part symmetry, the interconnected gallery rooms and the flexible display concept suggest that there is no hierarchical control over the whole set of morphological relationships and those governing the exhibition. The ambiguities that make the MoMA a hybrid example are, as previously described, based first on the tension between two competing cores of centrality and the diagonal accent of integration; second, on the main gallery sequence and the smaller rings of circulation; third, on the didactic message in the galleries and the blurring of classification contents diluting this message. These ambiguities are intentional, reflecting the dual response of the museum to both a didactic and an explorative approach to exhibitions. They expose the tension that arises from trying to balance the legacy of its connection to history with a progressive direction for the future.

It is important at this point to open a parenthesis in order to address the Parthenon and the Erechtheion. The two temples were instrumental in introducing the intellectual threads of the book, but stand in separation from the rest of the chapters. While it is interesting to note that they correspond to the two categories mentioned above – the Parthenon based on an overall morphological strategy, and the Erechtheion on multiple rules of local articulation – they are examples of pre-modern architecture. Pre-modern buildings were the outcomes of collective knowledge handed down to generations through tradition. In contrast, contemporary architecture is the product of complex processes including the process of conceptualization on the part of the designers. In the former the primary agency is culture. In the latter architects and specialists exercise comparative thought over and above the normative manifestations of culture. The emphasis on the conscious strategies of the intellect over the unconscious embodiment of rules emerges during the Renaissance, and largely develops since the Enlightenment. It separates architecture from the vernacular (Hillier 1996: 34), and pre-modern monuments from architectural works produced in modern and contemporary time.

Another characteristic that distinguishes the two temples from the rest of the examples is their semantic operation at the level of sculptural and religious representation. The Parthenon and the Erechtheion integrated sculptural ensembles with the building fabric. In contrast, modern museums create spatial assemblages of displaced objects based on certain types of rational and conceptual understanding. The two temples used architecture and the sculptural ensembles to articulate a view of the world as a cosmological, religious and political system. The latter are founded on a clear distinction between architecture and the exhibits – regardless of the occasional strong integration of the two – and are not models of the world; instead they are social constructions of knowledge based on conceptual modes of ordering and interpretation.

Foucault explains that until the end of the sixteenth century resemblance played a critical role in terms of how knowledge was built in Western culture. It guided 'exegesis and the interpretation of texts', organized the play of symbols and the art of representing them. But after the Renaissance 'similitude [was] no longer the form of knowledge but rather the occasion of error, the danger to which one exposes oneself where one does not examine the obscure region of confusions'

(2002: 56). So, the world and its semantic expression until the Renaissance are conflated into one physical and hermeneutic system (54). In contrast, knowledge in the modern world is founded on the recognition of the distance between things and their representation (19). However, while this distance is well understood, the symbolic function of the world has a continuous presence. Semantic codes such as those encountered in the Parthenon and the Erechtheion are still at work in contemporary architecture. We saw, for example, that certain museums construct tensions of a symbolic orientation like 'cathedral and palace', 'house and temple', 'culture and nature', to root their narratives into a historical past so as to give them universal significance. It is therefore crucial to note that in terms of semantic operation the boundaries between ancient and contemporary spaces are not as clearly established as might be initially argued.

In parallel with this argument, it is worth recalling that the discourse on classical buildings has been influenced by a tradition descending from Pythagoras and Plato, who established a mathematical relationship between the world and harmonious ratios.¹ Vitruvius extended this relationship from mathematics to the human body and to buildings linking architecture and nature symbolically through geometry and proportions. As a result, the two temples have been historically addressed through an analysis of classical order and mathematical theories of proportion. The discussion of the two structures in this book is, therefore, an attempt to *shift the emphasis away from the mathematical logic of form towards the relational logic of space*.

To obtain a deeper understanding of these issues and refine the key questions raised in this work I now turn to review the conceptual and perceptual in the context of broader theoretical ideas. This review is organized in three sections, tracing certain critical moments in the evolution of ideas from the pre-modern period to the present day. The first one examines Plato's theory of intelligibility, and locates the roots of the distinction between abstract ideas and the sensory world of experience in his work. The second section looks at the concept of space, its emergence in artistic and philosophical ideas of the eighteenth century and its impact on architectural discourse in the twentieth century. The last stage of this discussion examines recent theories of space developed by Tschumi, Lefebvre, and Hillier and Hanson with the view to focusing the discussion of the conceptual and perceptual on an analysis of geometry and spatial relations.

Theoretical review

Conceptual-perceptual, early origins

The distinction between abstract ideas and those aspects we observe through perception is built into Western design theory from an early stage as a *subject-object* problem (Gelernter 1995: 27). It is part of the theories of knowledge that originated with the Greeks, attempting to explain the relationship between the world and the mind. Pre-Socratic thinking pieced together an empirical view of the world discovered through experience. In contrast, Plato developed a theory of knowledge based on fixed forms and immutable patterns. The naturalist philosophers – Anaximander,

Thales, Anaximenes, and Heracleitos – provided Plato (428–348 BC) with an understanding of the world through sensory observation. At the same time Pythagoras (c. 580–500 BC) and his school gave Plato a description of knowledge based on unchanging laws, such as the angles of geometrical triangles summing up to 180 degrees independently of differences in terms of shape, material or size. If knowing comes from the senses, then everything is changing, disappearing with each different observer. But if there are unchangeable mathematical relationships, one had to explain how timeless forms transform into the flux of sensory experience (Gelernter 1995: 49).

Reinterpreting ideas from previous thinkers Plato foregrounded the conceptual over the perceptual, seeing forms as generic ideas, of which appearances were imperfect copies.² Starting with the distinction between two orders of reality, *Being* and *Becoming*, he set in *Timaeus* the question of the origin of the world created by a divine craftsman ('demiourgos') who copied an 'immutable idea' and used it as a standard. The world of *Being* concerns the objects of rational understanding and the operations of mathematics and logic. *Becoming* refers to things as perceived by our senses, about which no certain and final knowledge is possible. The relation between the two worlds is crafted by the notion of the *Intellect* or a creator as a metaphor, who models the world of *Becoming* on the world of *Being* just as a craftsman works with a plan or a model used as a standard.³

What is that which always is and has no becoming, and what is that which becomes but never is? The former is grasped by understanding, which involves a reasoned account. It is unchanging. The latter is grasped by opinion, which involves unreasoning sense perception. It comes to be and passes away but never really is (Plato: 28a).⁴

Appearing for the first time with Plato, the distinction between the conceptual and the perceptual becomes the underlying paradigm in Rationalism and Empiricism, a philosophical paradox that has a large influence on architectural theory and practice. Plato's ideal forms and Pythagoras' harmonic proportions in nature underline the prevalent direction of architectural theories towards the mathematical and visual aspects of form. In Vitruvius' *De Architectura* we see a distinction between an empirical conception of the origin of form from primitive shelters, with his rational belief in timeless principles beyond the contingencies of individual 'site, climate, or designer' (Gelernter 1995: 62). One of the timeless principles was the analogy of architecture with the human body through unvarying proportions discovered by the ancients.⁵

The preoccupation with the relationship of ideal forms to changing appearances re-emerges with the Renaissance architects and artists. Classical architects considered proportions as true measures. But at the same time they studied apparent sizes through perspective, seeking a means for reconciliation between truth and visual perception (Evans 1997: 256). The shift from Rationalism to Empiricism in the seventeenth century led to an emphasis on sensory appearance, first as a reaction to the rationalization in the academies and eventually as 'a celebration of the subjective and even idiosyncratic' (Gelernter 1995: 141). However, authors of

architectural treatises continued to acknowledge Vitruvian principles.⁶ In addition, with the exception of the French theory of expression, which stressed visual effects and sense impressions, they were concerned with classical orders and mathematical ideas of form, rather than the notion of space and embodied experience.⁷

The concept of space

The concept of space does not feature in the architectural vocabulary until the seventeenth century. It emerges among German writers through a tradition centring on Semper that saw space as enclosure, and a philosophical tradition founded on Kant (Forty 2000: 256–8). Addressing the paradoxes inherent in Rationalism and Empiricism, Kant made a distinction between the immediate impressions of sense (intuitions) and understanding, and argued for the ability of the mind to think in concepts. ‘Thoughts without content are empty, intuitions without concepts are blind’, while knowledge arises from their union (Kant 1993: 69). Influenced by Kant, Hildebrand and Schmarsow placed emphasis on the observer who is situated in space, suggesting that the mind perceives things by projecting in them its knowledge of bodily sensations (Forty 2000: 260).⁸ Springing from the line of thought that started with these writers, Frankl proposed that to see architecture means to bring together into a single mental image the series of images that are presented to us as we walk through a building (Frankl 1968: 142).

Space had rarely been discussed by architects before the twentieth century. From 1923 it merges with the idea of composition as a material that can be modelled in various ways (Tschumi 1995: 14). The emphasis on space served as a definition of the modern or as a new kind of freedom from historical constraints (Forty 2000: 268). Moholy-Nagy’s *New Vision* (1929), Giedion’s *Space, Time and Architecture* (1949) and Rowe’s essays in *The Mathematics of the Ideal Villa* (1947; see Rowe 1984) are examples of discourse grounded on the interaction between compositional ideas and spatial experience. In his analysis of Palladio’s villa Malcontenta and Le Corbusier’s Villa Stein, Rowe discusses the difference between what we observe by looking at the geometrical and mathematical logic of the structural grids drawn on a plan, and what we see inside these buildings (1984: 12).

In terms of recent theoretical approaches Tschumi’s notion of the *pyramid* and the *labyrinth* is the clearest demonstration of a dichotomy between space as a conceptual entity and as a perceptual field. Tschumi defines the pyramid as a mental thing, a dematerialization of architecture into the realm of concepts. It concerns how this thing is put together and what kind of properties it has. The *labyrinth*, on the other hand, is the space occupied by the body. ‘The architect conceives the pyramid, this ultimate model of reason. Architecture becomes a *cosa mentale* and the forms conceived by the architect ensure a domination of the idea over matter’ (1995: 20). For Tschumi it is impossible to simultaneously conceive and perceive space.

Architecture constitutes the abstraction of absolute truth, while this very truth gets in the way of telling. We cannot both experience and think what we experience. ‘The concept of dog does not bark;’ the concept of space is not in space (17).

Lefebvre and Hillier

Influenced by the work of Lefebvre, Tschumi explains that architectural discourse renders real space as a concept. However, in spite of the emphasis he places on space as pleasure, where concept and sensual reality coincide, Tschumi describes architecture as a synthesis of antagonistic notions. Shifting our investigation from architectural accounts to the theories of Lefebvre and Hillier, the division between the conceptual and perceptual is overcome by addressing space as a relational entity describing social patterns. Lefebvre explains that many attempts to define space operate in binary relationships, and suggests that the categories of mental and physical are inadequate in fully describing this notion. Engaging with representations of space architects, planners and social engineers see space as an abstract condition away from the perceptual nature of spatial practice. He argues for a unitary theory based on the idea of 'social space' seen as a 'social product' (1993: 26). Social space is defined as a triad: 'spatial practice', 'representations of space' and 'representational spaces'. Spatial practice is the 'perceived' space of daily reality encompassing the idea of 'spatial competence' and 'social performance' of a society. Representations of space are about 'conceptualized space' – the space of architects or specialists – and are related to knowledge, codes signs and spatial production. Finally, representational spaces are about 'space as directly lived through its associative images and symbols' (16). The perceived-conceived-lived realms are interconnected, encapsulating the ways in which a social member can move from the one to the other without logical confusion (40).

Lefebvre's theory is underpinned by three fundamental propositions: first space is 'social morphology' (94) and embodies social relations (27). Second, it is inseparable from the social agencies and the mechanisms of thought underlying its production; and, third, it cannot be studied as a thing of the mind separately from social life. Hillier also sets his thesis on space in opposition to prevalent theoretical distinctions between abstract and real. He explains that in spite of an increased emphasis on space in the last century, architectural discourse has dealt with this notion as an abstraction or as a by-product of social processes rather than as an experiential phenomenon that is inseparable from social aspects (2005: 96). The work of Hillier and Hanson known as space syntax is an attempt to account for architecture as a notion that is conceptually, experientially and socially defined.⁹

Space is addressed through the notion of inter-relatedness created by buildings and cities and is associated with the patterns of social relationships among people that use them (Hillier and Hanson 1984, Hillier 1996, Hanson 1998). The main thrust in this work is, first, the consideration of space as a system of relations, rather than as a collection of individual elements defined through the notion of *configuration* (Hillier 1996: 33). Configuration describes complex patterns we understand intuitively as rule sets in language, 'the apparatus we think with, rather than what we think of' (2005: 97). Second, it is the consideration of these relations independently of surface appearances, or traditional notions of geometrical order. Third, it is the view of space not as enclosure or background to human actions but as an integral part of the social actions of people. Spatial properties are studied as systems of

connections or adjacencies, which are understood based on the medium of social activity and movement.

Placing emphasis on the social aspects of daily life, Lefebvre and Hillier define space as a set of social relations. They help to shed light on the division between abstract forms and the experiential dimension by explaining that space is neither a mental thing nor a realm of sense impressions and human actions, but an entity that has a relational logic. This idea helps to shift discourse away from the traditional distinction of geometrical structures and physical matter. But whereas Lefebvre defines space as a triad consisting of conceived, perceived and lived spaces, Hillier focuses on space as an experiential and social field separately from the geometrical properties of form and the conceptualizations of designers. In the concluding section of this book I will return to the discussion of Lefebvre and Hillier with the view to explaining the significance of describing both the conceived and experiential dimensions of buildings. At this point I will turn my attention to space syntax as a method of describing and analyzing architecture based upon spatial relationships. The purpose is to present the contribution of these methods to the question raised in this book: how do the properties conceived by designers relate to the properties we observe through spatial experience?

Conceptual and perceptual

Geometry and space

Space syntax provides a theoretical and analytical method for describing spatial properties from the viewpoint of the situated observer. This is possible through representations like 'axial lines' (lines of sight and movement), 'convex spaces' (spaces every point of which is visible from every other point) and 'isovists' (visual polygons capturing what is visible in a space from a vantage point, a tool initially developed by Benedict [1979]). The property of integration was described earlier in the context of the analytic description of the buildings, but it is important to explain how it is measured in this discussion. Integration accounts for global spatial relationships and can be made clear through 'justified graphs'. These are graphs representing each space with a node and each spatial link by a line as in Figures 5.6a, b and 6.4a, b. Justified graphs are used to assign numerical values to spatial elements based on how many spaces we need to traverse in order to move from one space to all others. If the paths from a space to everywhere else travel through few spaces then this space is *integrated*. If they cover many spaces, the space is *segregated*.

The property of integration can be measured based on axial, convex or isovist maps depending on the different types of layouts, or the characteristics most crucial for the questions at hand. For example, urban systems based on a street pattern are usually described through axial lines capturing the linear extension of space as a characteristic of movement, whereas small scale buildings, and in particular houses, are best accounted for through convex spatial relations. Describing visual integration is based on using the isovist from each grid cell as the unit of the analysis ('Visibility Graph Analysis').

These methods raise the question of how the perceptual field captured by these representations relates to global conceptual relations measured by integration. Addressing this question in cities, Hillier proposes that a series of perceptions made by a moving observer arrive at a conception through *description retrieval*. Labyrinthine space, for example, means that streets are uniform and short and lack the longer lines that enable us to comprehend a city. The metric variable of length is the decisive one in defining how easy or difficult it is to retrieve a description of space (2003a: 06.18).

Where the same total length of line is divided into a few long lines and many short ones, as we typically find in cities, then the moving observer sees more space over the time spent in movement than if the lines are of even length, and the information obtained from the longer lines is more redundant and therefore more structural (2003a: 06.18).

The structural relations of line lengths unite the perceptions received gradually with the conceptual properties of integration. 'The perceptual is synchronized to become the conceptual and aggregated into a picture of the whole system' which in this way is at once perceptual and conceptual. But the conceptual and the perceptual in buildings and cities are also related to geometry, shape and form, which are factors that space syntax does not take into account in the description of spatial characteristics (Hillier and Hanson 1984).¹⁰ Hillier explains that axial lines, convex spaces and isovists are geometrical notions describing space through linear and convex concepts. However, the analysis focuses on the configurational property of integration as the degree to which we can pass through other spaces to go to all others. So, configurational measures are applied to geometrical elements, but the relational framework of geometry does not enter this process. This is because the interest is in describing space as a condition of human experience rather than as a product of conceptualizing buildings through geometrical shapes and their properties.

Architects use geometry to organize relations among spaces through architectural drawings and models. Geometry captures not just abstract patterns but also the visual framework of these patterns, turning abstract rules into representations. Crossing the divide between the abstract and the visible, geometrical systems represent our knowledge as visual entities and as abstract conceptual structures. Seeing a circle, for example, we grasp a geometrical rule specifying that all spatial points of the perimeter are equidistant from the centre. But we also see a visible unit. In contrast, what we see in space lacks a fixed shape of visible knowledge. It does not consist of objects against a field but *is* the field of visual relations. Instead of having a figurative fixation, perceptual space is subjected to variations in visual information experienced through time.

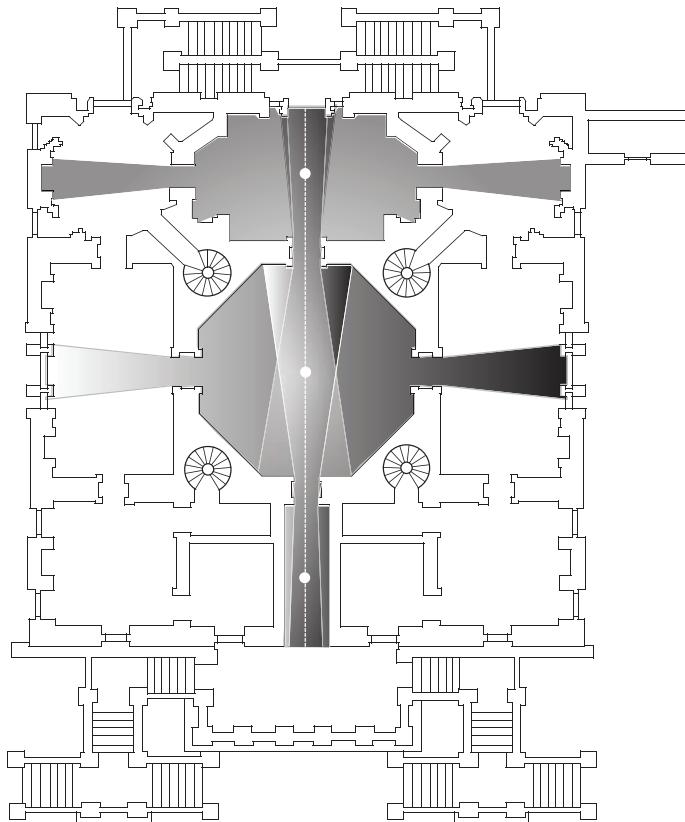
It is possible to suggest then that geometric properties are abstract and representational at the same time. They are properties we observe in drawings and spaces and *project* back to the world conditioning our understanding through abstract rules as well as through visible representations. Perceptual space, on the other hand, is observable but not reducible into a visible schema. Geometrical structures can

be understood at an instance, replacing empirical observation with a figurative idea due to their representational logic. In contrast, seeing what individual spaces are like requires one to move and see them from different spatial positions. Similarly, understanding which areas are visually closer to all other areas, captured through the notion of integration, relies on visiting spaces in temporal sequence. This distinction between the geometrical logic of space and integration helps to clarify that there are two relational aspects in the conceptual: one referring to geometric properties describing spaces and forms; the other to rules captured through global configurational relations. As for the perceptual, this is the changing information observed from points seen sequentially rather than knowledge of a total structure. It is bound to time and can relate to the conceptual through movement and observation.

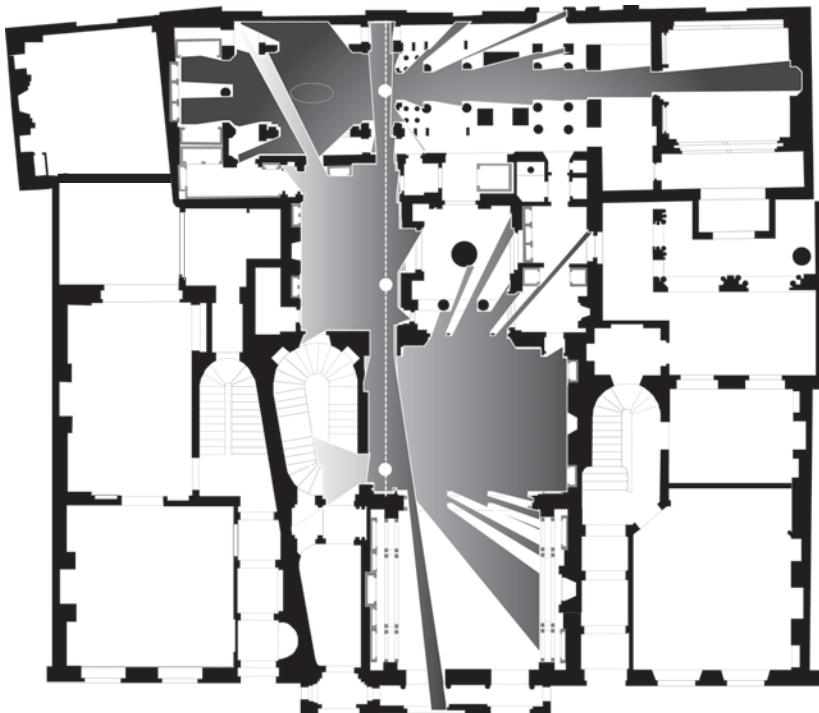
Comparative review of buildings

Geometrical and syntactic relations

Returning to the comparative synthesis, I identified previously two categories of buildings; first is a category in which geometry organizes spaces according to an overall geometric rule, expressed visually through a surrounding boundary (Museum of Scotland) or an axis of symmetry (Natural History Museum). In the second



9.1
Chiswick Villa,
London. First floor
plan. Isovists from
central axis.



9.2
Soane's Museum,
London: first floor
plan. Isovists from
Dining Room,
Breakfast Room and
Dome.

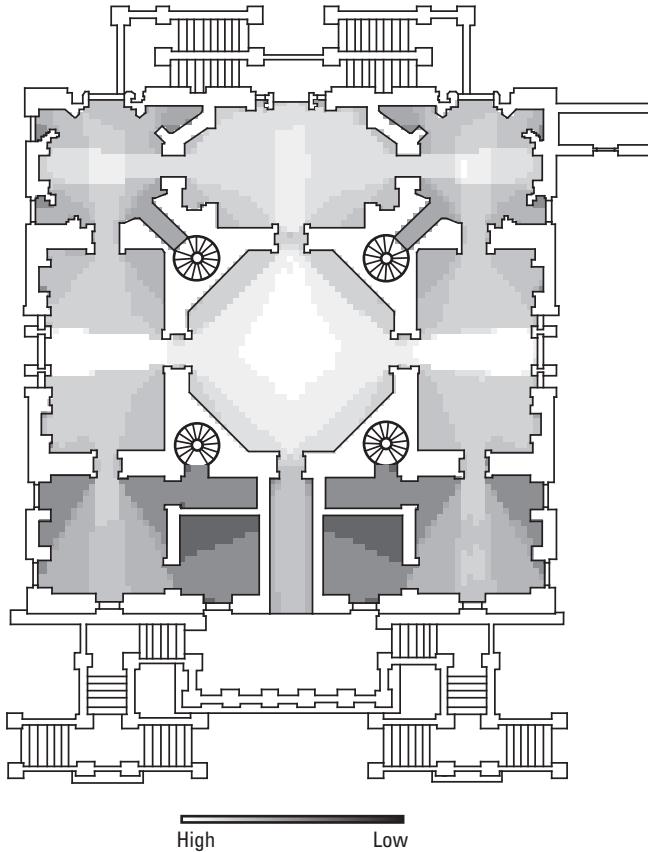
category the geometrical and spatial logic is based on local rules, so that there is no synthesis of parts into an overall concept (Soane's Museum, Kelvingrove and Burrell). The former tend to dominate perception by a *stable* conceptual idea, through axially synchronized views and relatively uniform vistas. The latter do not subordinate perception to a geometrical notion. They create local visual variation and a changing pattern of information in terms of what is experienced.

To demonstrate the differences between the two groups I will compare two strikingly different cases in relation to their geometrical order: the Soane's Museum and Lord Burlington's Chiswick villa. The visual fields produced along an axial path in the villa are always centred on this path, preserving the alignment of the doors and the axial perspective (see Figures 9.1, 9.2). In the museum they shift on either side of the axis along with the visitor's movement. In the former they vary only marginally in terms of shape and direction. In the latter they are considerably different from each other, revealing different parts of the plan and stretching in different directions. Strung in axial geometrical sequence the rooms in the villa constrain the potential for variable visual information, and emphasize the power of the axis as a mechanism that controls the experience. The museum constrains the individual vistas to a much lesser extent, developing a sense of surprise, discovery and spatial anticipation. The villa cannot surprise its visitors as visual fields repeat along a route and from symmetrical viewing positions.

Another strong difference between the two examples concerns the relationship between the global properties of integration and the overall geometrical

9.3

Chiswick Villa,
London. Visual
integration.



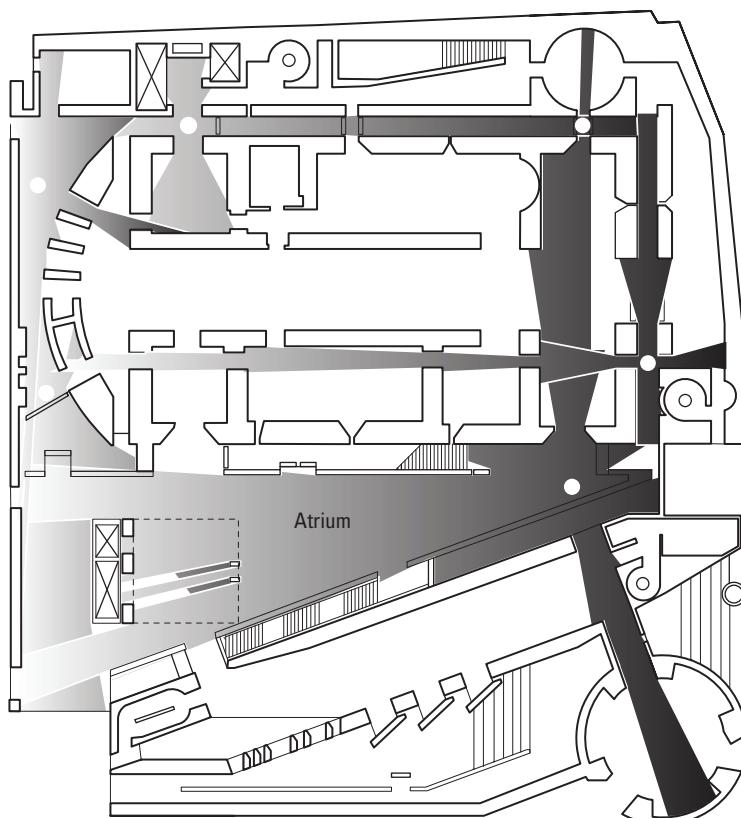
structure. The distribution of the highest levels of integration in the villa follows the east to west axis. In the museum it does not pick up any geometrical principle but follows the intersection of the long axes of sight and movement (see Figure 9.3). Geometry in the villa controls visual fields at the local and global scale, expressing the structure of integration as a geometrical idea. The theoretical preoccupations of the Renaissance architects with stable notions of mathematics and forms over and above the changing nature of sensory observation is revealed in the way in which the potential of transformation from one visual field to the other is geometrically limited. In Plato's terms *Being* dominates *Becoming* or following Frankl's suggestion the 'architectural image', that is, the three-dimensional understanding of the whole, 'always leads to the same indestructible, fixed unity. In short, ... [it] presents only one image' (1968: 146).

The Natural History Museum and the Museum of Scotland are obvious cases of a correspondence between geometrical and spatial relations, the former based on the central axis organizing a hierarchical allocation of integration that decreases from the front to the rear, the latter spreading decreasing levels of integration from the centre to the periphery of the building (Figures 6.6, 6.7). In the Natural History Museum the major axes of sight and movement produce axially

aligned views and similar vistas. In the Museum of Scotland the enclosing boundary of the inner galleries is constantly visible from the peripheral spaces, revealing the compositional strategy of layering (see Figure 9.4) (Psarra and Grajewski 2000a).

Contrary to these cases, integration in the Soane's Museum and the Burrell follows a pattern of long intersecting axes that cover the layout from side to side, but are not conditioned by regularity and an overall geometrical schema (Figures 5.9, 7.10c). The Barcelona Pavilion distinguishes between an integrated exterior and a segregated interior with respect to the translucent box, but the box is not placed at the geometrical centre of the building (Figure 2.6). In addition, nothing in the geometry of the Pavilion highlights a privileged viewing position (Figure 2.12a-d). Finally, the MoMA is a hybrid case, with integration intensifying the geometrical position of the atrium at the centre of the gallery volume and the diagonal link between the centralities of the atrium and the garden (Figure 8.2). Although integration is located inside the atrium, the diagonal accent of its distribution pointing towards the garden and the cascade of solids and voids relax the overall effect of geometry on spatial experience.

In the cases of a strong correspondence between geometry and the structure of visibility, a formal idea is foregrounded, raising the abstract properties into a representational level of visible relations. Formulating understanding and



9.4
Museum of
Scotland,
Edinburgh. Isovists
from peripheral
spaces and atrium.

conditioning perception, this idea is projected back to the work to make inferences about those spaces that are not seen yet, and clarify differences observed locally. In the cases where perceptual variation gains predominance, as in the second category of buildings, the representational role of geometry is weak, and understanding emerges from the logic of spatial relations as the by-product of perception. *So, the relationship between geometric and spatial properties can be understood as based on the varying degree of geometrical control over the potential for variance in the structure of visual fields observed with bodily movement.* Based on this definition I can suggest that these buildings are perceived in two ways: either through a strong geometric system conditioning the spatial structure of visibility, or through the non-representational character of spatial relationships.

In the first group rooms are symmetrically arranged, windows are at the end of vistas, voids and stairs are placed between spatial layers, and paths are used to expose formal strategies. In the second group geometry guides rather than determines the way in which a building is viewed, and space stimulates exploration, continuously re-ordering experience. Rather than limiting local differences by the overall tactics of shape and form, the emphasis is on allowing such differences to generate surprise and unexpected discovery. Spaces are linked diagonally rather than approached frontally, vistas change along a route instead of staying invariant, and spaces are positioned off-centre, competing with the major axes of sight and movement. In the first group understanding is *represented* through the stable logic of form and geometry. In the second group it lacks a cohesive system of representation. It is less crystallized, less predictable and more dependent on spatial relationships observed from different spatial positions that generate variable readings.

Intellectual and sensual – a creative tension

It is important to recognize that in spite of consistencies that lead to the identification of two groups, most buildings are complex and nuanced systems. In the majority of the cases there is a creative tension between the abstract and the experiential. In the Barcelona Pavilion and the Soane's Museum, for example, the asymmetrical arrangement gains its significance through the juxtaposition with local geometric symmetries. In the Burrell the egalitarian nature of the grid and the interconnected network of galleries are contrasted by the courtyard controlling the sequence at the beginning of the visit. In this way, the interconnected exhibition spaces are distinguished from Burrell's domain with the former being the area of free exploration and the latter the domain of institutional meaning. In the Kelvingrove the circuits of movement allowing a variety of ways to explore the collection are opposed by repetitive visual fields that synchronize perceptions because of the two-part symmetry of the building. Finally, works based on a strong geometric order like the Museum of Scotland create an ambient environment through contrasts of darkness and light, and an experiential rhetoric based on an immense amount of details in the design. Although the museum foregrounds the idea of layered centrality as an overall formal strategy that dominates the perceptual realm, it invests in local spatial variation, creating a variety of sensual experiences.

The creative tension between the conceptual and the perceptual

translates to a tension between seeing and understanding. By emphasizing local scale and changing views buildings in the second group encourage moving and viewing. By employing long axes of visibility they synchronize local with global scale information. Engaging both aspects they arouse senses and intellect, and call attention to the building and the design as an exercise in choreographing simultaneous and successive aspects of experience. The appreciation of a building in this way demands the viewer's collaboration. It never resolves into a fixed idea, remaining open to a field of possible readings. It is no accident that buildings like the Soane's Museum and the Barcelona Pavilion invite a vast amount of attention among scholars and architects. It is the nature of their arrangement of spaces and views that stimulates interest and generates a wide range of interpretations.

Turning our attention to the classical villa again, the strong pattern of correspondence between geometric and spatial properties it constructs reflects a view of the world based on the predominance of stable geometric relations over sensual experience. A counterpoint to this example is the Romantic landscape, which with its serpentine lines of movement favours a diversity of views over axial order. In the villa the conceptual dominates the perceptual, informed by theoretical ideas about the permanence of shapes and numbers. In contrast, in the garden the perceptual gains predominance, fuelled by concepts of harmony with nature and pastoral happiness. These two examples seem to construct an *illusion* of dichotomy between conceived and perceived notions of space. The villa implies a conception of the world as complete and coherent that disciplines body and mind. Evans explains that classical buildings solicit the belief that 'all things in their fullness and variety are subsumed, organized, and animated by abstract relations', planting evidence that what we recognize as real derives from invisible relations (Evans 1997: 251). English gardens, on the other hand, appear to dispense with conceptual planning to demonstrate that they substitute the freedom of thought for the tyranny of order. However, they disguise the fact that the apparent informality of nature they produce is choreographed through winding pathways and staged through carefully framed vistas.

The dichotomy illusion is different from the categorization of the conceptual and perceptual as a dominant opposition. This opposition becomes central in the work of architects like Tschumi. It is an attempt to construct a critique of the ways in which geometric entities have been associated with idealism in Classicism, intelligibility in Modernism, or various institutional messages in historical buildings. Tschumi's dissociation of three geometrical systems in Park de la Villette (points, lines and surfaces), or Eisenman's ruined grids of Modernism (Vidler 1992: 144) show that geometrical order is used to create not a skilfully constructed illusion as in the previous examples, but a semantic expression of dichotomy between abstract and sensual.¹¹ However, architecture is not simply a symbolic expression of thought or an empirical fact, but also a social field interfacing abstractions, situated bodies and complex actions of people. The question is not to express the idea that space is freed from established mechanisms of thought by resorting to the conceptual-perceptual dichotomy, but how to develop fresh mechanisms of thought to explore

their relationship. The final section of this chapter and the concluding section of this book investigate these possibilities more closely.

Conceptual, perceptual and narrative

I will now move from the morphological rules to the ways in which these rules relate to the conceptual strategies of the exhibitions. The strong structuring of geometric and spatial properties in the first group of buildings corresponds to the hierarchical arrangement of the display concept. The absence of a strong morphological order in the second category coincides with the lack of hierarchical order in terms of the narrative organization. We saw that the coincidence of geometry and integration in the Natural History Museum and the Museum of Scotland communicate the taxonomic classification of the imperial collection in the former, and the identity of Scotland as historical progress in the latter. In contrast, Soane uses distinct spaces to arrange the collection into rough historical 'chapters', but mostly assembles objects into groupings of personal and aesthetic significance. Similarly, in the Kelvingrove and the Burrell the display is organized into fluid categories of knowledge. The MoMA is an ambiguous case, resisting and adhering to the prescribed message of previous installations. The Barcelona Pavilion has no programmatic constraints, its meaning deriving primarily from the manipulation of form, space and materials. However, it is not entirely devoid of semantic expression, carrying with it potential associations such as those identified by Constant in her characterization of it as a picturesque garden (1990). The Soane's Museum has also a semantic function at the level of form, spatial relationships and sensual effects alluding to Neo-classicism, Romanticism and the Gothic.

In the Natural History Museum and the Museum of Scotland the geometric and spatial strategies are used by the architects and the curators to organize the cultural message. These strategies control all relations to restrict different interpretative stances or ambiguity. In the Soane's Museum and the Burrell the geometry, space and the conceptual mechanisms of the installation do not correspond with each other, allowing different communicative channels to co-exist. Eco's notions of unconventional works versus works that are unambiguous can help us clarify the differences between these buildings. Studying examples of modern music, art and literature, Eco puts forward a distinction between 'open works' or 'works in motion', and those where the forms of expression remain substantially standard and conventional (Eco 1989: 13). The former do not have a single definitive order but a multiplicity of ordering relations. The latter constrain the formal distribution of elements into as few organizing principles as possible. 'Open works' lay emphasis on a variety of interpretations. In contrast, works of the second kind channel interpretation into a particular direction. The first are unconventional, producing interpretive instability. The second communicate stable meanings.¹² Eco associates the 'open work' with art of recent origins, appearing with Modernism. But he also explains that its characteristics can be found in other historical periods and particularly in the architecture of the Baroque, which by denying a static frontal position induces movement. Baroque poetics are the first clear manifestation of the 'open work' but do not emerge as a conscious preoccupation with this kind of order.

The idea of 'openness' is linked with the mathematical theory of information. Starting from the proposition put forward by this theory that the information of a message is in inverse proportion to its probability or predictability (Moles 1996: 19), Eco suggests that the 'open work' conveys a high degree of information because of 'radical contraventions'. Redundancy within a system, taking language as an example, results from a set of syntactic and grammatical laws. The more ordered and comprehensible a message, the more predictable it is. In contrast, the less ordered the more it becomes original. The difference between the two systems does not tell anything about the distinction between good and bad art, since the break of conventions is not a guarantee of aesthetic value. However, it allows us to understand the type of information and the mode of operation of different works in terms of communicating meaning.

Based on these distinctions I can propose that buildings in the first group are concerned with unambiguous semantic expression using the spatial properties to strengthen a representational geometric order and the content of the collection. The second group consists of works that are 'open', allowing spaces and artefacts to enter into multiple relationships rather than structuring interpretation. The former eliminate the potential of space to shape multiple relations among the exhibits, and submit the morphological properties to geometrical and narrative representation. The latter optimize the power of space to produce many connections among art works, and avoid strong codes of signification, resisting a single interpretation. The first group constructs geometrical, spatial and narrative coherence. The second one creates discontinuities that resist consistency and coherence. The buildings in the first group engage with narrative as a strong message. The rest do not narrate but present. They do not speak explicitly but inexhaustibly indicate, provoking an interpretive process rather than directing interpretation.

Architecture and literature

Moving from architecture to the study of literature it was proposed that Borges uses conceptual mechanisms like geometrical tessellations that multiply the interrelations of narrative units. The tessellated structure of the fictions causes characters to mutate and interchange, expanding into a wider range of meanings than those that are expressed by the narrative content. While adopting the traditional form of narrative progression Borges enables the reader to move freely amid multiple interpretations. Other writers achieve similar effects through different strategies like Joyce who in the *Wandering Rocks* in *Ulysses* provides multiple perspectives from the viewpoint of many characters and narrative voices, or Mallarmé, in whose *Livre*, if he had finished it, the reader could have combined the pages of the book in different sequences.¹³

It was observed that the contrast between temporality and simultaneity in Borges' stories is reinforced by his use of architectural metaphors. Cities, symmetrical buildings and labyrinthine environments are negotiated by characters in search of a theory that can impose order on lived chaos. These examples evoke the sequential nature of experience, and the synchronic nature of spatial properties intensifying the idea of architecture and literature as ordering relations in space and

time. The architecture *of* the text with its geometrical structure is thus expressed by the architectures *in* the text. The idea of a homeomorphic correspondence between architecture and literature suggests that Borges' fictions are relevant to the second group of buildings and can be described as 'open' works. They construct prolific and shifting interpretations instead of exhausting the field of possible meanings. But while the museums in this group use the rich potential of space to expand the aesthetic content of objects, Borges deploys the potential of geometry to expand the semantic content of fiction. The actual effect in the two media moves in opposite directions. In architecture openness emphasizes embodied experience, which eventually turns to a representation of time over space. In Borges' work openness draws attention to the conceptual structure, turning the fiction to a representation of space over time.

The influence of architecture upon Borges' work is not limited to the use of labyrinthine sequences or symmetrical structures. It extends to the historical and theoretical ideas associated with the design of these places. Villas and gardens in his fictions evoke the principles of Classicism and Romanticism, with the villa expressing the world as eternal proportions and numbers, and the garden articulating a view of the world as idyllic informal nature. These associations express a metaphoric relationship between arranging relations in literature and formulating theories through art, philosophy and science. Borges blurs the distinction between ideas, buildings and texts, first, to create a poetic relationship among these artefacts and, second, to intensify the fact that although they influence one another, in reality they are different categories. This is because buildings as real events do not coincide with the theories that represent them. Likewise, real life does not correspond to its representation in fiction. The difference between constructing a model of the world and the world itself is characteristically expressed by the way in which characters, and we as readers, are captured in the stories in an attempt to find a solution that can restore order. The proposition Borges puts forward is that theories and texts are representations of the world rather than accurate reconstructions.

The study of Borges is useful, less for providing an analogy to architecture through literature, and more for showing that the morphological mechanisms that order experience in architecture and fiction are informed by the theoretical aspects of knowledge that is involved in their design. But his work is also significant in showing that the study of theoretical concepts alone is not sufficient to explain the real experience inside buildings. The importance of theories as sources of meaning in architecture was shown in the analysis of the Natural History Museum and the Kelvingrove. The description of the different ways in which scientists and curators viewed the study of nature in Victorian England and Scotland illuminated the morphological differences between the two layouts. However, the two definitions of nature cannot describe the organization of space, and how it is experienced by people. To this issue I now turn to discuss the characteristics of visitors' experience, which was investigated in the context of the Natural History Museum, the Kelvingrove and the MoMA.

Space, display and visitors' exploration

The analysis of these museums enables the formulation of a first proposition regarding the way in which the properties of space and the organization of the exhibition design relate to the exploration patterns of visitors and the social character of the visit. The strong pattern of congruence between the different levels of properties in the Natural History Museum is used to ensure that the display is read in a specifically planned way. Visitors move in the galleries in linear sequence, confirming the observation made earlier that the layout offers limited possibilities for exploring the exhibitions. In contrast, the Kelvingrove generates different explorative routes and encourages visitors to discover alternative viewing positions. Similar observations can be put forward in relation to the fourth and fifth floors at the MoMA. The galleries on the fifth floor are more interconnected and inter-visible compared to those on the fourth level. These differences are related to the explorative behaviour of visitors, diverting movement away from the main sequence on the fifth level, and limiting movement to the main route at the north part of the fourth floor.¹⁴ In the Natural History Museum and the fourth floor at the MoMA movement is controlled by the cultural programme, and the strong message of the exhibition. The emphasis is placed on the functioning of the layout to facilitate the transmission of the educational message. On the other hand, the Kelvingrove and to a certain extent the fifth floor at the Museum of Modern Art encourages spatial exploration. Priority in this case is given to space as the means of creating rich patterns of exploration and meaning. The former use space and architecture to satisfy a didactic purpose. The latter explore the possibilities emerging from space to give different shape to a multiplicity of educational, social and aesthetic purposes.

Conclusion

The elements of the study that dealt with the social functioning of museums show that the morphological description and the analysis of movement are crucial factors in understanding how museums and exhibitions work and how they are viewed by people. But as stated before, we should recognize the role of other areas of knowledge in architecture such as theories and philosophical concepts. Morphological properties of space are unique to architecture, but they are not the only characteristics the designer needs to produce a building that is a work of architecture. These issues are addressed in the final chapter of this book, suggesting that the definition of architecture as a creative phenomenon through its own morphological properties is inseparable from historical and theoretical discourse; equally, the study of architecture through theoretical discourse can be illuminated by the morphological construction of meaning.

Chapter 10

The formation of space and cultural meaning

In any event, the spoken and written word are taken for (social) practice.

– Lefebvre, H. (1991), *The Absent Body*,
trans. D. Nicholson-Smith, Oxford: Blackwell, p. 28.

Form and meaning

In this book I raised the questions of how to explore architecture as a set of abstract relations and as a field of embodied experience, looking also at the ways in which these fields relate to cultural meaning. Underlying these questions is a wider inquiry that has characterized architectural theory, often expressed as a split between the conceptual characteristics of buildings and their physical and cultural dimensions. This split has found multiple expressions in binary relations, like mind and body, mental and physical, form and function, form and meaning. At certain moments in theory and practice, notably in the work of Modernist architects and historians, the relationship between the two sides has been regarded as definitive: form is seen as an expression of essence, historical period or function (Forty 2000: 289–90). At others, as with the criticism of Modernism and structuralism offered by Postmodernism, the assertion is that there is not a close bond between the two: the abstract forms of Modernism dissociate architecture from ‘figures’, carrying meaning by cultural association (Colquhoun 1985: 190). Alternatively, meaning is socially constructed rather than described by forms in any determinate way (Tschumi 1999: 201).

Most of these arguments are founded not only on antithetical concepts but also on a reaction to a previous paradigm, replacing one kind of binarism by another. So, the disappointment with functionalism at the end of the twentieth century turned from the form-function relation to the relation between form and meaning. For Lefebvre functionalism was one of the parameters responsible for the creation of ‘abstract space’, preventing us from understanding how spaces are ‘directly experienced’ (1991: 369). Influenced by Lefebvre, architects like Tschumi argued that architecture cannot be reduced to notions of conceptual order and functions, but should be addressed by the movement of bodies in space, together with the actions and events that take place within the social and political realm of buildings (1999: 3). As stated in the introduction to this book, the reaction to the

form-function relation is frequently coupled with a reaction to the notion of order. This is based on the assertion that order is not responsible for meaning, as this is produced by the social processes of interpretation. There is also the view that order is abstract, objective, or *universal* leading away from the cultural, subjective, experiential and idiosyncratic qualities that give space the distinctive character of place. Finally, order had been seen as *reductive* and exploited by dominant forces of production and consumption, promoting an illusion of transparent meanings (Lefebvre 1991: 28). As a result, for the latter part of the twentieth century the notion of order does not enter the architectural vocabulary or the theoretical investigation of architecture (Forty 2000: 248).

But together with the reaction to the notion of order there has been an unparalleled production of forms. If social meaning has been freed from function, the proliferation of forms and digital technologies of modelling provide evidence that architecture is not freed from the abstract relations through which forms are handled. On the contrary, the expression of the relationship of architecture to one kind of order or another has been intensified. Adrian Forty explains that if architecture does not create order by arranging conceptual relations, *there would be no need to have architecture at all*. The process by which buildings are produced and cities are changed can be left to happen on its own; on the other hand, if architecture produces order, 'it is involved in something much bigger than it can possibly handle, the process by which experience is filtered, transformed and fed back to us in reduced form, all in the name of "culture"' (2000: 248).

In this final section I will explore why a morphological study is essential in understanding architecture and cultural meaning. I will go on to explain the reasons for which this in itself is insufficient, and identify what other kinds of knowledge we need to explain the formation of content in buildings. The morphological study is discussed by reference to Tschumi and Hillier's ideas on the relationship of space to human experience. It is argued that geometrical and spatial relations can reflect how buildings embody social knowledge or generate a rich potential for social meaning. Finally, the theory of Hillier is considered in comparison to that of Lefebvre. This last part of the discussion concludes that we need to place the morphological analysis within the context of historical and theoretical understanding. Likewise, historical and theoretical analysis needs to be informed by morphological properties as an essential source of meaning.

Geometry, space and cultural meaning

One of the first architects who tried to resist the 'dematerialization' of architecture into conceptual structures was Tschumi, through a reaction to functionalism and a suspicion of all abstractions of order and models of thought. In a collection of articles written in the 1970s and 1980s Tschumi explains that 'there is no space without event, no architecture without a program'. He adds that few theorists dare to explore the relationship between architectural abstractions and places that confront spaces, actions, the movement of bodies and events (1999: 141). Programme and order are notions that could not be dispensed with but questioned, deconstructed and reinterpreted. However, the way in which Tschumi reinterprets these notions

reveals potential contradictions. These can be shown through a brief consideration of his discussion of the design of the Park de La Villette.

La Villette destabilizes functional conventions through concepts derived from cinema, literary criticism and other disciplines (193). It is composed of 'repetitions', 'distortions', 'superimpositions' and 'programmatic instabilities' that challenge and push the notion of order to the edge. The geometrical grid used in the design does not have any definitive meaning, 'functional', 'realistic', 'contextual' or 'finite', or carry the personal style and signature of the architectural team. It is 'anti-functional', 'abstract', 'infinite', 'anti-contextual' and anonymous, leading to infinite interpretations (195). The whole idea of the Park is meant to be never fixed, but 'deferred, differed, rendered irresolute by the multiplicity of meanings it inscribes' (201). In this way, La Villette marks an end to the 'utopia of unity' becoming post-humanist architecture (205).

La Villette, then, aims at an architecture that means nothing, an architecture of the signifier rather than the signified – one that is pure trace or play of language. In a Nietzschean manner, La Villette moves toward interpretive infinity, for the effect of reducing fixity is not insignificance but semantic plurality (203).

The assumption is that if meanings are multiple and socially constructed, the design is a testimony that there is not a deterministic relationship between form and function. By assigning meanings (such as 'functional', 'realistic', 'contextual') to a geometrical concept from the ways in which it has been interpreted in architectural discourse and architectural contexts Tschumi performs a process of signification. The purpose is to show that content is never transparent (201), but the attached meanings draw attention to the fact that, seen in isolation from architectural signification, the grid is purely abstract and logical. The intention to resist the dematerialization of architecture in La Villette results in the intensification of the grid as an abstraction, and of the signification process. In this way, La Villette is led back to the position it tries to escape from: the dilemma of forms being abstract and meanings being social.

Tschumi's suggestion is that social meaning is in the semantic potential of abstract structures and their capacity to question contextual histories, architectural theories and existing styles. This stands in clear contradiction to his assertion of the importance of meaning found in the programme as a particular pattern of activity, events and movement of bodies. The implication of these contradictory views is that the relation of architecture to society exists either in the human actions in the Park, or in the repertory of logical forms and theoretical speculations. Trying to overcome the functionalist idea that a confluence exists between the ways in which we live in buildings and forms, La Villette leads us indirectly into two more confluentes: that of abstract geometrical entities with social life, and that of theory with building.

One of the arguments frequently used as evidence that no causal relationship between form and social meaning exists is that buildings can accommodate programmes conceived for different purposes (114). The question, however,

is not whether buildings can house different activities over time, but whether the physical factors related to one mode of living are compatible with another, and what kinds of spatial or social changes are essential for a transformation of use. Comparing the interconnected matrix of spaces in Renaissance domestic interiors with the corridor plan in English houses of the nineteenth century, Evans explains that the two examples were symptomatic of different cultural patterns: the Renaissance interior created close interaction among people transgressing class separations. The English house, on the other hand, was founded on the distance between social classes and the restriction of social encounters (1997: 88). So, the two domestic settings would not allow an interchange between the different living modes without spatial changes being necessary to sustain the cultural pattern. Alternatively, social devices would have to be developed to compensate for a layout which was either unsuitably rigid, or extremely permissive. Assigning multiple social contents to abstract logical entities, the design of La Villette questions the relationship between form and function. But while it is well understood that abstract concepts like the grid do not describe or prescribe a way of living, the question of how the social patterns of class transgression or separation found their way into the Renaissance and English houses remain unanswered.

Hillier's attempt to answer this question is based on the idea of configuration. The theoretical paradigm of functionalism derives from the wrong assumption that architecture is some kind of machine for social engineering. The implication is that specific social outcomes can be achieved by manipulating architectural forms (1996: 301). For Hillier a building does not impinge directly on human behaviour, while the relationship between architecture and society passes neither through forms nor functions, but *through the realm of space and the variable of spatial configuration*. As explained at the beginning of this book, configuration defines the non-discursive spatial and social relations society uses unconsciously to operate in space like rules in language. People understand complex spatial patterns intuitively 'even though they cannot describe them linguistically'. This is because 'as with language where we do not think about the syntax while we are using it, the relatedness of things forms part of the apparatus we think with, rather than think of' (2005: 97).

Examining a sample of French rural houses one sees that the *sale commune* – the everyday living area – is the most integrated space, more than the *grand sale* for formal occasions, a characteristic revealing a relationship between the spatial structuring of the house and gender relations. When the order of integration of different activities is similar across a large number of houses we can see evidence of a cultural pattern or 'genotype'. Configuration is the social information itself governing what happens in the building. The building as a material entity is not culture, but by being a realization of the underlying structures of society, it is the means 'by which the society as an abstract structure is realized in space-time and then reproduced' (1996: 310).

Studies of the relationship between urban spaces, and the ways in which people move, point to the gravitation of the highest levels of movement towards the most integrated streets. Modulating movement, space in urban areas and complex buildings like museums and galleries produces patterns of social co-presence, a kind

of *virtual community* based on mutual awareness rather than a pre-structured pattern of social relations. So, buildings can receive information from society through spatial configuration, but also transmit effects back to society through the same means. These two aspects are dynamically interrelated. In the first case space is used in a *conservative mode* to reproduce existing social relationships and categorical differences as in the French house, what we know naturally as the elements of culture. In the second case space is used in a *generative mode*, creating a potential for social encounter. Through their spatial properties buildings are embodiments of social information specifying what must happen and where. However, these properties can also *shape* a social pattern since by shaping movement they create potential co-presences among people (2005: 98).

Returning to the comparative analysis of buildings examined in the previous chapter, I can suggest that the museums that are characterized by a strong correspondence of geometric relations, spatial relations and the concepts used to organize the exhibition are based on a conservative mode. This is because they subordinate all levels of properties to a single conceptual idea to construct a semantic expression of structure, ideology and educational content. They embody and reflect the conceptual ordering of the building and the collection as an overly structured message. In contrast, museums that are not organized by a correspondence among these systems of relations demonstrate a generative mode, releasing a rich potential for social information. In the former the exploration itineraries of people are controlled to convey information in a definitive way. In the latter viewers browse the collections in different modes, showing that space generates diverse patterns of contact with the art work and social awareness. If the social function of museums is to interface visitors with the collection and with each other, the first model does so in a didactic way, reflecting a pattern of exploration together with the educational and ideological concepts. The second model does not express a particular type of explorative behaviour, or an educational or institutional idea. It allows visitors to take different explorative approaches, and enables the exhibition arrangement to open up to a multiplicity of interpretations.

Space is the primary factor related to how spatial continuities and discontinuities are negotiated in a layout by people. However, the way in which it relates to geometry can inform the cognitive aspects of buildings and how visitors approach the collections. When spatial connections are intensified through geometrical axes and punctuated by art works, they construct static views of synchronic visibility and suggest frontal positions. Space tends to be seen as a predictable field that conditions movement at the small and large scale. This is because the coherence of geometric and spatial parameters observed locally can be used to project what lies ahead, pre-conditioning the ways in which the building and the installation are spatially revealed. In contrast, where geometric and spatial relations do not correspond tightly, the organization of the building is not pre-empted or explained by the representational factor of geometry. Geometric and spatial elements do not relate to each other in a coherent way but interact as they inform the experience. For example, from the front two spaces in the Soane's Museum the geometrical axis linking the two rooms seems to prevail (Figures 5.4, 5.5). But as the viewer shifts

position towards the oblique axes of sight and movement that penetrate the entire depth of the plan, geometry loses its relevance as these lines carry visual information about a much larger scale. Buildings in this category offer not only a rich pattern of social awareness but also diverse and personalized experiences. In the former, form and geometry are embedded and reflected in space as a mode of *conceiving* spatial relations and exhibition messages that construct a *shared* way of seeing. By not expressing a conceptual organization, the latter generate a rich social potential and *individual* ways of seeing.

The lack of a conception of the non-discursive properties of configuration is what led theoretical and architectural investigations at the turn of the century to reject the functionalist doctrines (Hillier 1996: 301). The social failures of Modernism and the consequences of the form-function paradigm in the social realm have confirmed the central importance of studying the configurational properties of buildings to see how they work and carry out the programme of social activities and movement (376). But it is also apparent that the lack of a conception of configuration leads to a division between the conceptual properties of geometry and the experiential dimensions of buildings. In the absence of a notion of spatial configuration, space is not seen as having relational logic as opposed to geometry that clearly has abstract relations. Tschumi's notions of the pyramid of concepts and the labyrinth of experience are characteristic expressions of this split between abstract and experiential. For Tschumi it is impossible to escape from the paradox of 'immaterial architecture as a concept, and of material architecture as presence'. This is because 'sensual reality is not experienced as an abstract object' (1999: 29).

However, spatial experience is also governed by conceptual properties captured by geometry and the pattern of integration. By organizing geometrical characteristics and spatial configuration architecture constructs a relationship between conceived and perceived aspects of space. It is not suggested that this relationship is understood in the same way by different people, or that it is not dependent on the social, economic and cultural conditions of context. What is argued is that architecture is ordered neither in the abstract logical realm of concepts nor in the empirical realm of the senses and social activity. The conceptual and the perceptual aspects of architecture pass through spatial properties, geometric properties and their interrelationship. This interrelationship is defined as the different degrees of geometric control on the variance of visual fields observed by movement. It co-ordinates visual perceptions, experiential and social patterns *in space and time*, and synchronizes perceptual fields, gradually offering a prescribed or a varied experience.

The configurational analysis of space is essential to avoid the assumption that buildings as conceptual structures are purely abstract, while as experiential realms they are social and sensual. This assumption leads designers to the substitution of semantic content for the ways in which content is spatially constructed. Assigning multiple meanings to geometrical forms by a process of association does not equal the way in which social activities and spaces are experienced inside buildings. The absence of the conception of spatial configuration can lead alternatively to the functionalist assumption that there is a one-to-one match between social realities and geometrical concepts. The conviction is that since social intentions are placed

in the design they must somehow find their way into the real building. For example, arranging a group of housing forms around a set of open spaces, fencing the layout and calling it a 'community' does not necessarily coincide with the pattern of social relations and customs. Interestingly, both assumptions – that meaning is socially constructed or based on abstract notions of form – are symptomatic of a belief that theoretical and geometrical ideas equal the world as we encounter it in everyday reality and social life.

The significance of spatial configuration is, therefore, in describing how people experience and manipulate space in buildings and cities. However, devoted to the analysis of spatial patterns that confront us in the real world of everyday life, space syntax turns away from the geometrical and formal dimensions of space. The intention is, first, to develop abstract theoretical propositions so as not to restrict the generation of ideas during the early stages of the design; second, to provide analytical and predictive models that can be used to improve the social performance of buildings and urban areas during the stages when designs are refined rather than generated (Hillier 1996: 49). Social meanings in buildings pass through the medium of configuration, but configuration is not the only knowledge we need to recognize meaning in architecture. As stated before, geometry and its relationship to spatial configuration are also sources of content. A relationship of correspondence between the two levels of properties stabilizes and represents space as a strong geometrical and cultural message. Conversely, a lack of correspondence, coupled with the generative potential of space, can suspend cultural messages and generate unpredictable meanings.

So, geometry can bear upon the cognitive, aesthetic, semantic and social aspects of architecture. But it is also the medium through which buildings are visualized and explored in the design process. Geometric properties work as representations used to generate spaces and forms, explore and resolve their logic at the conceptual level and the would-be experiential level. They are also models of thought diagramming abstract propositions about spatial, social and conceptual entities. The power of geometry to articulate spatial relations and theoretical speculations interfaces the design of buildings with concepts both internal and external to architecture and its social programme. The origin of these concepts ranges from precedents and architectural theories to the conceptual strategies of exhibitions. It is often found in theories and strategies from other disciplines like painting, cinema, music and literature. As the study of Borges showed, geometrical forms move across the divide between abstractions produced in language and the buildings he recounts in his fictions. Evans attributes the power of geometrical shapes to link ideas across fields to their capacity to travel between 'the visible and the invisible, the corporeal and the incorporeal, the absolute and the contingent, the ideal and the real'. In architecture their task is to convey shape from one state to another, and as such they are 'changeless in themselves and volatile in relation to everything else' (1995: 38).

Therefore, morphological analysis should encompass the study of geometry, spatial configuration and their interrelationship, as factors that are all crucial for understanding architecture and cultural meaning. An approach that explores geometrical ideas only is limited to a study of form like the classical theories of

mathematics and proportion. Similarly, a study focusing just on spatial configuration and use patterns excludes the organizing powers of geometry. However, it is important to explain that the morphological analysis is not sufficient to capture the full spectrum of knowledge needed by designers to engage with architecture as a creative activity. This is because buildings are not just morphological entities, but also theoretical explorations in the realm of the imagination. They produce interventions in the real world as well as theoretical propositions with the view to create a new reality. So, while it is evident that the study of architecture requires the analysis of morphological properties of the geometric and spatial kind, it is also clear that this is inadequate to provide a complete understanding of architecture as innovative activity. The question that remains to answer is: what other kinds of knowledge are essential to understand architecture as a creative exploration of meaning? Turning our attention to the two major investigations on space by Hillier and Lefebvre, I will argue that morphological analysis should be set within the realities of context, the realm of theoretical ideas and their historical evolution.

Innovation

In the previous chapter it was proposed that the work of Soane and Mies generates multiple interpretations in many different ways, one of which is the exercise of creative choice over an existing repertory of morphological canons. If knowledge is handed down to us through sets of theoretical ideas, precedents and rules, the creative imagination seeks not to reproduce but appropriate and change them. These observations mark the distinction between architecture as the creative outcome of intellectual thought in contrast to employing existing rules transmitted by history or culture. Looking at what architecture adds to building, Hillier defines it in antithesis to the vernacular. Vernacular buildings use tacit rules that are taken for granted in the same way in which rule sets are used in language. The vernacular reproduces socially accepted patterns that define the architectural competence of the community. In contrast to this, architecture exists by 'reference to a would-be universalistic competence arrived at through the general comparative study of forms aimed at principle rather than cultural idiosyncrasy, and, through this, at innovation rather than reduplication' (Hillier 1996: 33). The judgement we make that a building is architecture is based on observing evidence of a systematic intent which goes beyond the reproduction of cultural norms leading to invention.

The non-discursive properties of configuration enable the study of regularities where the invariant differences within a pattern of activities point to a normative rule or cultural genotype. Genotypes capture the unconscious rules that are reproduced as the means of 'transmission of culture by artifacts' (1996: 32). Architecture exists 'to the degree that there is genotypical invention in the non-discursive, that is invention with the rules that govern the variability that is possible within a style' (34). Inventive changes in cultural codes take place in the vernacular tradition also, defining the way in which we see evidence of architecture in the vernacular (34). But whereas the vernacular uses configuration as ends, architecture uses it as means. It brings the unconscious rules of culture into the conscious level of 'abstract comparative knowledge' from a wide range of building forms.

The study of configuration can help identify genotypical invention at the non-discursive level of spatial relations. However, invention can also occur in architecture without a conscious engagement with innovation. The architects of the Erechtheion did not reproduce a religious genotype based on a single entrance and a sequence of spaces, but a new spatial arrangement consisting of a number of entrances and interconnected spaces (Figures 1.7, 1.12). But the idea of theoretical knowledge and intentional innovation was entirely alien to them as they were following rules that were 'divinely' given (Gelernter 1995: 61). Architecture as a theoretical discipline is a modern phenomenon that emerges in the Renaissance period. But even if we narrow the focus to modern space, we cannot judge that a building is architecture outside historical and cultural considerations. It is not argued that buildings have or should have an unbroken relationship with the cultural, historical or geographical location. What is argued here is that architecture and the judgement we make about it are historical acts. They require not simply knowledge of configuration but also knowledge of architecture and its associated thought systems through history. The supra-cultural or supra-historical intent we may detect in some architectural works does not release these works from a historical and cultural context. Neither does it release our judgement from historical and theoretical understanding.

Therefore, we need to consider the definition of abstract comparative knowledge of configuration by examining a number of additional factors. First, how it is produced; and, second, how it relates to constraints imposed or eliminated by the realities of social, cultural and economical context. Finally, we need to explore how it links with knowledge that is not just configurational, that is, knowledge of theories produced at the discursive level of theoretical study.

Structure and sequence

Configurational analysis can contribute to architecture through the selection of synchronic systems that reveal either variants pointing towards reduplication, or invariants indicating innovation. The idea of innovation would seem at first to suggest that architecture produces configurational worlds that are constantly expanding. But inventive configurations become embedded into successive architectural productions, ultimately becoming normative principles with time. They are not steady, or a-temporal, but emerge in their original form at a particular moment and become reproduced in subsequent realizations. If the comparative analysis is set outside the evolution of configurations, it leads to the idea of rules as abstract entities that have no realization. They are either *a priori*, or once created by society they are fixed and resistant to change.

In an early critique on structuralism and the primacy it places on structures in *The Social Logic of Space* Hillier and Hanson concede that structures consist of rules, which if seen as anterior to the social event are there to be followed. The authors reverse the concept of structure, suggesting that the spatio-temporal event precedes the rule. The rule exists only when abstract description is retrieved from a spatio-temporal reality and re-embodied into another. Structure is in a kind of 'reality sandwich', reality1-rule-reality2, a dynamic scheme rather than a pre-existing

pattern (1984: 204). The mind reads structure, reinvents it and 'learns to think the language of reality', that is, it retrieves a description, which it embeds into a new specific condition.

It is evident that the notion of the reality sandwich recognizes the primacy of the real event over the rule also implying the acceptance of temporal sequence. However, although the emphasis is placed on the space-time relationship between reality, mind and rule, the authors do not see the various parameters associated with spatio-temporal realities and their transformation as a source of meaning. Buildings, cities or urban spaces are studied at different historical moments, using space syntax to detect changes in the configurational network over time. But meaning is derived by analyzing space and finding its links back to society 'as a receptor and active agent' (Hillier 2001: 13.6). The epistemological framework of this approach is based on the assumption that, first, spatio-temporal realities are 'phenotypes', that is, varied surface manifestations of rules rather than the rules by which we recognize society in space; second, configurational patterns are unconsciously used rather than applied with a conscious intention. And, finally, society and space emerge as the result of a large number of individual actions in different locations (2001: 13:7). What matters most, therefore, is how non-discursive patterns work at the overall level, rather than the influences that might bring these patterns about.

Seen as an emergent system, society moves from one reality to the next, reproducing patterns or producing new rules, but without any conscious engagement with previous and subsequent realities in order to decide on a direction. But architects work within the opposite premise. They are situated within a particular context, consciously exploring possibilities for direction. The normative patterns defining the cultural competence of society is what stays constant in the flow from one reality to the next. In contrast, architecture as the conscious engagement with possibility aiming at innovation is not found in what is stable between different realities, but in the moments when rules become unstable. Society at the non-discursive level of normative rules is situated in the *rule* and its *re-embodiment*. Architecture is situated in the *moment* and the *suspension* of that re-embodiment. It does not produce genotypes and phenotypes in the same way in which the tacit rules of the vernacular produce phenotypical variety. Its nature is to produce a creation for which no genotype exists. Its configurational patterns can become genotypes through subsequent reproduction in other buildings. However, if architecture achieves its aim of innovation, it is by definition at that time a unique configurational instance outside of possible norms.

But architects operate within programmatic, cultural, economic and technological parameters. This brings us to the second factor mentioned previously as necessary to define abstract comparative knowledge. The thought system we recognize in architecture is exercised not just in a theoretical realm of possibility, but also within particular realities that enable or restrict possibilities for invention. Architecture does not necessarily have a cause and effect relationship with economic conditions, demographic shifts, technologies or geographical variations. Contextual realities do not act as determinants, explaining architects' choices or their buildings. However, they impose or remove constraints from what is configurationally pos-

sible. If architects innovate, it is not because they exercise unlimited speculation, but because they operate within restrictions on possibility, working within these limitations and finding ways to overcome them. Comparative knowledge founded solely on a synchronic study of spatial relations excludes the factor of contextual influence as limiting or opening up possibilities for innovation. It is the understanding of realities as they impact on possibility that opens the way to possibilities that do not yet exist.

Contextual factors, such as social, economic and technical demands for performance, are sources of meaning since they capture those points by which architects define their *resistance*. They have the potential to limit the range of possibilities necessary for innovation to a set of existing and recurrent solutions. Aiming at the production of new knowledge, architecture resists by its very nature all factors that can undermine this purpose. The intention is to accept contextual and performance pressures in their fullness, but resist their determinacy and normative value. Contextual factors define what architecture tries to respond to and transfigure. They are often foregrounded by architects when they describe their buildings not in order to justify their choices, but to show that the contingent can be manipulated to achieve larger significance. A characteristic example to illustrate this argument is the onyx wall in the Barcelona Pavilion. The accidental discovery of the onyx block by Mies and the demands for economic use of a costly material caused adjustments to the height and the footprint of the building. This accidental event would seem initially to have acted as the main determinant for the decisions behind the proportional relationships of the design. But as was shown in the second chapter, the wall was put at the service of an aesthetic intention. Mies adjusted the dimensions of the Pavilion to this element in order to dematerialize it through reflections. By co-ordinating the end points of partitions he assured that the wall would reflect the surfaces it occluded, 'erasing' optical obstruction.

It is not the accidental discovery or the size of the onyx block that illuminates the building, but the building that gives the accident a wider significance. This transformation from incident to a higher order intention intensifies what architecture means by revealing what architecture *is not*. It is not the constraints that give meaning to architecture and determine its course. It is the way in which architecture engages with the constraints that provides evidence of creative thought. Context and the limitations it imposes is an important source of meaning. It shows how architecture is achieved under uniquely different conditions by transcending those limitations. Architecture is not simply in the comparative understanding of possibility, but also in the way in which it responds to specific constraints imposed on possibility.

Expanding the foregoing discussion into the larger context of history begins to identify the role of history in recognizing innovation. Architects are not concerned with contextual realities and how they are replicated in historical sequence, but with how morphological possibility can be explored to give these realities different shape and meaning. But in order to deviate from rules that are stable to produce a unique reality, they need historical understanding. This does not mean an understanding of architectural history in the narrow sense of the sequence of building

forms, or that designers cannot innovate intuitively without knowledge of history. Architects' engagement with history is different from that of historians, although it is influenced by the interpretations provided by them. Their grasp of history is not as a discipline that studies the facts and forms of the past, their evolution and its own processes of interpretation. History provides architects with a set of existing building forms and a set of factors that have enabled or restricted possibilities.

Examining the notion of '*structure as constant*' and '*history as process*,' Eco suggests that 'if structure is associated with the mechanisms of the mind, then historical knowledge is no longer possible' (1989: 232). 'All sociohistorical material could be submitted to a double reading': on one side, the diachronic study of causes and effects, and, on the other, the synchronic selection of systems that should not be considered definitive but useful to explain the relationships between different cultural areas at a given moment (233). A synchronic study of configurations can identify variants through which we recognize patterns that are tried and tested, and invariants through which we identify invention. But the comparative understanding of cultural products in historical sequence can help to identify when innovations occur in history, and reveal the parameters that restrict or enable these innovations, thereby intensifying cultural meaning. The abstract comparability of buildings and forms, therefore, should be set within the historical evolution of buildings and forms. Likewise the morphological analysis of architecture needs to be set within a historical context.

Theory

But architectural history is not confined to the study of evolution of forms. It also encompasses the study of the evolution and recurrence of thought systems. In addition, as Forty explains, history is not capable of definitive truths but changes depending on interpretation (2000: 203). This raises the issue of how architecture is conceived by architects, historians and theorists, ranging from the building forms to theoretical ideas used in the design of buildings. It extends beyond this to the ways in which buildings and theories have developed through scholarship and practice. Morphological systems are not self-contained; the rules of configuration defining social knowledge through which we recognize society in space are non-discursive and therefore internal to the system. But while these rules are adequate to describe society as we recognize it in space, as stated previously, these rules are not architecture. In addition, architecture is not society, but a realization of society in the spatial configuration of buildings as well as a conceptualizing discipline. It configures non-discursive patterns that people use unconsciously but is exercised at the level of conscious thought. It imports unconscious rules from society, changes them and exports rules and systems of thought that are developed through conscious application. It is argued that meaning in architecture is found not only in the non-discursive properties of configuration that describe social knowledge of the everyday world, but also in the world in which architecture is conceived: conceptual, temporal and discursive.

A discussion of the theories of Hillier and Lefebvre at this point can help to illuminate the relationship between the non-discursive rules of configuration and

the discursive aspects of space. Hillier's theory of configuration is an attempt to establish an analytic theory of architecture 'as the necessary corollary of architectural autonomy' (1996: 40). Lefebvre offers a philosophical theory as mediation between architecture and spatial practice (Hays 1988: 175). Hillier proposes that analytic knowledge brings to the level of conscious understanding those principles we use unconsciously in the process of experiencing buildings and cities. Further, he distinguishes between analytic theories and architecture theories used by architects in their design. The former describe how the world is, creating abstractions by which we understand social knowledge embedded in the world of concrete spatial relations. The latter, on the other hand, renounce what the world is, in favour of what it should be.

In contrast to this view, Lefebvre argues for a unitary theory of social space that can link perceived space (spatial practice) with the ways in which space is conceived (representations of space) and lived (representational spaces). As explained in the previous chapter, spatial practice defines the competence and performance of society and the social and experiential form of space as a daily reality. Representations of space concern conceptualized notions developed by architects, scientists and planners, and define the dominant space of any society or mode of production. Finally, representational spaces are about space as directly lived through images and symbols. They refer to those spaces the imagination seeks to transform by overlying physical space on them, and making symbolic use of its objects (1991: 38–9).

Lefebvre's notion of spatial practice is defined not as a pure form or absolute abstraction but as a set of relations among things (1991: 83). It presupposes the use of the body, implying particular social relations. In this sense it is close to Hillier's definition of space as configuration that either embodies social relations or generates patterns of social co-presence. However, for Hillier social knowledge is primarily based on non-discursive properties and can describe buildings and cities as entities emerging from distributed process (2001: 13.7). Conversely, Lefebvre's sees social space not as an emergent phenomenon but as one that is produced by the dominant forces of conceived space, perceived and lived passively by the majority of people, and appropriated by the intellectual or artistic imagination.

Hillier's emphasis on the non-discursive characteristics of configurations sets social, analytic and architectural knowledge apart. In contrast, Lefebvre suggests that 'spatial practice is lived directly before it is conceptualized' (1991: 34), but is interconnected with conceived and lived space. The separation between the three kinds of knowledge proposed by Hillier is useful in describing the differences between them, but we also need to understand their interrelations. Social knowledge of spatial practice is retrieved, embedded, reflected and reproduced (conservative mode or cultural genotype), or generated by space (generative mode, patterns of social awareness). But there is also knowledge that is conceived and produced by social agents, such as professionals, specialists and scholars. Practitioners work in universities, or interact with academia, while also belonging to the collective levels of spatial practice. Social agents formulate links between situated practices through 'multiple overlapping memberships' (Hillier 2001: 13.21). But at the same time they

form networks of different kinds of knowledge moving between these memberships (academy, practice, institutional bodies, clients, councils, organizations, communities and so forth). Although the three types of knowledge can be discretely defined, knowledge in the real world is not compartmentalized into distinct areas, but flows between them.

The system of zoning, for example separating cities into areas of different land uses, became a social reality, a part of the daily life of Western cities. But it is also a theoretical idea imposed on cities at specific periods, which the morphological study without knowledge of urban theory cannot bring to the level of conscious thought through analysis. Similarly, the theoretical principles used by architects and the set of abstractions developed within the theory of architecture over time inform the design of buildings and the factors of social life. We can learn a lot by discovering abstract laws through a synchronic method. However, diachronic understanding of laws and theories is essential in describing 'what is that which is' and 'how to think that which is' (Eco 1989: 233). Architecture is not always limited by the existing cultural understanding available at each time, but the configurational and cultural knowledge that produced one form is not always comparable to the systems of thought that led to the production of another. As stated previously, the architects of the Parthenon and the Erechtheion innovated at a number of different levels, but were following 'divine' rules. Similarly, the Renaissance architects made discoveries in the area of perspective, but at the same time they were studying and reproducing the works of the ancients. Romanticism introduced the creative freedom of the individual renewing the debate about objective forms as found in nature, and those emerging from the creative resources of the designer.

The definition of architecture as abstract comparative knowledge aiming at innovation, therefore, should be expanded to include the way in which architecture has been defined historically. The synchronic and diachronic method is relevant not only to the study of space, form and their historical evolution as different realizations of restrictions on possibility, but also to the study of abstract thought and its historic development. The study of architecture and cultural meaning can be seen in the context of Eco's notion of double reading, as a discussion of 'a-temporal invariant structures with the acceptance of historical sequence' (1989: 233). Eco points out that historical rationality 'should make multiple events and readings possible'. 'Structure (stable and objective) and process (qua creation of continuously new structures)' interact in the 'reality of the intellect', a reality in a state of continuous renewal but whose forms however mutable constantly structure through universal laws diversified conditions (233–4).

For an example of a double reading we can look at Gelernter's history of Western design theory in terms of the source of architectural form (1995). Exploring the historical evolution of buildings and ideas that influenced design Gelernter identifies certain constants centering on the subject-object relationship that were supported by Western philosophical theories like Empiricism, Rationalism and Romanticism. Thomas Marcus' *Buildings and Power* is another example, looking at the relationship between spatial form and social meaning in a range of building types from the Enlightenment to the Industrial Revolution (1993). Another approach is

Evans' account of the relationship between geometry and architecture as evidenced in the history of architectural projection and in buildings from the fifteenth to the twentieth century (1995). One of the main arguments in Evans' work is that ideas expressed in theories and texts do not provide full and authentic interpretations of buildings, reinforcing thus the need for analyzing the buildings themselves. But his discussion of these texts reveals underlying similarities and differences in the processes of thinking in different periods, and the ways in which these processes influenced architecture.

Hillier suggests that 'the unconscious configurational rules no longer provide automatic cultural guidance as it is in the vernacular tradition' (Hillier 1996: 2). For Lefebvre this is because the conceived has acquired speculative primacy over the lived, causing 'practice to disappear along with life, and so [doing] very little justice to the unconscious level of lived experience *per se*' (1991: 34). These observations justify the significance of the non-discursive and discursive aspects of architecture, informing the way in which we live and think in buildings and cities. The conscious abstractions used to analyze and conceptualize architecture or act upon the world of the concrete, and the traffic between conceptions of space and the unconscious rules of spatial practice, are essential factors for defining architecture as innovative activity and as analytic and theoretical study.

What motivates innovation?

At the heart of this discussion is the definition of architecture as a morphological and theoretical exploration of possibility aiming at the invention of a new reality. The aim in this last part of this book is to explore how the two areas, conceived space and spatial practice, relate to innovation. For Hillier this passes through the level of configuration and genotypical instability so that a cultural pattern is no longer represented in space. Lefebvre suggests that it is the category of lived space (representational spaces) that the imagination seeks to change and appropriate (1991: 39). I will suggest that innovation passes through all three spaces, spatial practice, conceived (representations of space) and lived space (representational spaces). Through their very nature, to be stabilized and reproduced non-discursive rules and discursive aspects of space become *representational entities* in the creative imagination. They express meanings that are stable and fixed as different kinds of competence. Their re-embodiment and reflection in space raises them to the level of conscious comparative thought and increases the potential for their inventive suspension.

Non-discursive norms of social knowledge are configurational structures that through their embodiment and reproduction in space reflect the normative rules of society, the conservative modes of spatial practice. In this way, they have the potential to become representational entities not in the sense of symbolic objects or spaces understood collectively as higher order structures of institutional or ideological nature, but as patterns through which the creative thought builds its personal experience, recognizing spatial practices but also its own existence by living inside them.

Representations of space (conceived space) occur in different forms. A powerful instance of representation is when the conceptual network of geometric

relations corresponds with the configurational spatial relations and the conceptual frameworks from other types of knowledge. These frameworks include institutional, political or religious messages or knowledge from other disciplines for the purposes of borrowing, analogical or metaphorical intensification. An example of such frameworks is the humanist system of axial symmetry, encapsulating cosmological theories and symbolic expression. The correspondence model gives the structure of all levels of knowledge a visible and representational syntax. The structural coherence between the different types of relations, configurational, geometric, conceptual and semantic, raises them to the level of observable knowledge. By being spatialized and reproduced in buildings and cities these structural coherences become representational entities in the sense of higher order codes through which society begins to recognize its representation in space.

A particular form of representation refers to morphological languages through which spaces and forms are handled to certain effects (aesthetic, material, etc). Morphological languages define the skills and compositional competence of architecture as observed in real buildings and representations of buildings through images and drawings, journals, exhibitions and publications. They absorb the architect's creative attention so as not to be handled automatically leading to reproduction. When they are embedded and reproduced in buildings and journals they become representational entities in the sense of *compositional codes*, established idioms the creative imagination seeks to question and destabilize.

Another form of representation occurs in architectural discourse through the study of the evolution of forms, the thought systems associated with these forms and their own evolution. Included in this are the various types of classification, analysis and dissection of architectural production into styles, orders, proportions, relationships, architectural movements and the provided systems of interpretation. These representations become also representational entities when we recognize a systematic pattern of occurrence of abstract concepts and theoretical abstractions that are produced, embedded and reproduced in theories, a kind of a *discourse genotype*. As Bonta explained in the analysis of the critical theories of the Barcelona Pavilion, interpretations of the Pavilion among theorists emerge from the moment a vocabulary of concepts is developed to verbalize the building and then get reproduced in subsequent interpretations (1979: 138).

To explain how all these categories of space interact in the creative intellect seeking to innovate, let me take the Soane's Museum as an example. In the museum we recognize abstract comparative thought that moves beyond the normative rules of living. We see a morphological approach moving away from the correspondence between geometry and space as used in classical buildings. We also observe an aesthetic arrangement of the historic collection that extends over the conventional classification principle and the semantic expression of history as a definitive message. Finally, we see evidence of a creative interpretation of existing theories and thought systems. Soane integrates the display elements with the facts of his daily domestic existence not to express the empirical factors of his daily life, but to make the house relevant to a larger synchronic universe of aesthetic juxtapositions. He uses the art work and mirrors to articulate not simply his own

narrative as the owner of the house and its programme – as it was considered appropriate by Le Camus de Mezières whose theories Soane was reading – but to install the house and his presence in the larger framework of architecture, the arts and universal history. Finally, he employs a creative interpretation of precedent, and theoretical understanding from the Enlightenment, Romanticism and the French theory of Expression.

The kind of innovative intent we find in architecture seeks to move beyond what is normative and culturally reproduced as a recurring pattern, at the level of the non-discursive aspects of spatial practice, the rules defining the relationship of geometry to space, and the discursive elements of theoretical ideas. When patterns within these areas become stable they turn to representational entities the creative imagination has lived through, learned, practised and experienced, recognizing society and its own existence within them. Representational entities are entities the imagination seeks to transform not because they represent, but because they do so in a systematic and persistent way, becoming habits of thinking and doing. Through their reproduction in space and time the creative mind recognizes the unconscious collective as well as its own unconsciousness. Representational entities express normative rules and models of thought, non-discursive and discursive genotypes that the creative intellect seeks to question and change. Lacking the conception of configuration architects often believe they resist only conceived, discursive and institutional models, whereas in reality innovative thought seeks to destabilize all aspects, normative social knowledge, morphological languages, theoretical knowledge and their recursive representations.

The ways in which architectural discourse enters this process is by raising rules recognized in precedents and theoretical studies to the level of conscious knowledge, and back to the practice world through building examples, architectural languages, theories used by designers and concepts. This recursive process of multiple overlaps between spatial practice, conceived and lived space define the abstract comparative knowledge architects use to instigate change. When the collective reactions to non-discursive and discursive elements of space become stabilized we see evidence of a collective idiom, or compositional and discursive genotypes, which can provide a definition of what historians call architectural movements. The reproduction of these genotypes leads to counter-reactions advancing opposite morphological languages and theoretical paradigms.

The intellectual dimensions of architecture as the application of conscious thought aiming at innovation passes through all of these areas of knowledge, social knowledge of normative rules, compositional and theoretical knowledge of conceived space. The social motivations for innovation pass through the notion of social and intellectual agencies and memberships. The importance of defining knowledge as a network of these memberships is crucial in order to understand how agencies participate in the design of space, how architects are involved in this process and how they can influence social change. Architects and scholars of architecture do not make the strategic decisions that characterize the production of the built environment. They respond to the client's need for a building and a programme, and provide critical accounts and analytical evaluations. However, they can influence the

client's conception of a programme and affect the factors that shape spatial and social experience. If this were not the underlying core of architecture, architects would not have attempted throughout history to imagine better worlds and designed so many utopias. Architectural theories should achieve analytic knowledge of configuration to ensure that the social transformations architects attempt have a positive effect. But they should also understand all dimensions of knowledge within which architecture operates in its pursuit of innovation and change.

We can then define the comparative knowledge of architecture aiming at innovation as knowledge of possibility against a repertory of existing forms, and those that are latent and not yet realized. Morphological properties can be understood comparatively first on the basis of their internal logic of relations and second within historical evolution. They are considered as possibilities enabled or restrained by historical realities. Finally, comparative knowledge is also subject to the cultural and architectural frameworks of thought, or the variety of ways in which architecture is conceptualized.

Architecture and Narrative argues for a single theoretical framework that interfaces the ways in which designers and professionals conceive architecture and the ways in which people perceive and live in space. It asserts the need to distinguish between spatial practice and theories, and explore the morphological properties of architecture in terms of how they relate to conceptual and perceptual notions of space and embodied experience. But the true potential of the morphological study cannot be verified outside historical context and the study of cultural products and theoretical ideas over time.

Notes

Introduction

- 1 Porter suggests that designers have often to convince others about their thinking process and the intellectual underpinning of the design as much as the end product. One approach 'is to develop a narrative disclosure, that using precedents and influences drawn from inside and outside the building culture tells the story of the process of the design' (2004: 130).
- 2 Tschumi's notion of architecture as implying narrative does not suggest a direct translation from one medium to another, like the translation 'Don Juan into a play, an opera, a ballet, a film or comic strip', but a set of equivalences or 'observed parallels'. 'Terragni's Dantemum does not tell us a story of events but reminds us about the temporality of a search – the impossibility of being at several places at the same time – a special type of allegory wherein every element initially corresponds to a physical reality' (1999: 165).
- 3 See Peponis and Hedin (1982), Pradinuk (1986), Choi (1999), Psarra and Grajewski (2000a, 2000b), Huang (2001), Peponis and Wineman (2002), Stavroulaki and Peponis (2003), Tzortzi (2003, 2004, 2005, 2007), Hillier (2005), Hillier and Tzortzi (2006), Psarra (2005) and Psarra, Wineman, Xu, Kaynar (2007).

1 The Parthenon and the Erechtheion

- 1 'But the most holy symbol, that was so considered by all many years before the unification of the parishes, is the image of Athena which is on what is now called the Acropolis, but in early days the Polis (city). A legend concerning it says that it fell from heaven' (Pausanias xxvi, 5–7).
- 2 The best-known example of this type is the little temple of Apteros-Nike at the south-west side of the Acropolis.
- 3 It is essential to clarify that in spite of technological and typological development previous types were not obliterated. In fact the peripteral temple was one type of structure that stood among many less advanced or complex religious shrines. 'All that was necessary to make a shrine was that a piece of ground or a natural or artificial object should be dedicated to a deity. In classical times shrines of the simplest and most complicated form continued to exist side by side' (Wycherley 1962: 89). In addition, there were variations within each type. Greek temples were strongly conventional in design, but as Coulton suggests, 'no two of them are quite the same, not even those that are believed to be works of the same architect' (Coulton 1991: 16).
- 4 This was a repository for armour and many bronze objects, mentioned in inscriptions of the middle of the fourth century BC (Wycherley 1978: 134).
- 5 The order in which Pausanias describes what he saw on the Acropolis suggests that from the entrance court he moved to the west and north side of the Parthenon. He must have approached the Erechtheion from the east before returning to the Propylaia (Wycherley 1978: 150).
- 6 The procession was part of a festival that was called the *Greater Panathenaia* and was an enlargement of an older ritual, *the Lesser Panathenaia* inaugurated by Erechthonius-Erechtheus, an ancient king of Athens. The large festival was celebrated from 566 BC and comprised a sacrificial procession, musical and dance competitions, athletic contests and races.
- 7 With the exception of the roof of the Propylaia, Pausanias makes no reference to the architecture on the Acropolis, referring only to statues, religious objects and the narratives they would instigate.

His description of the Parthenon sculptures is short and limited to the thematic content of the east and west pediments and to the gold and ivory statue of Athena. In contrast, he gives an extensive and detailed account of the Erechtheion's religious objects.

- 8 The temple was dedicated to Athena Polias, but between its construction and the time of Pausanias' visit, in the second century AD, it became known as the Erechtheion.
- 9 In Hesiod's *Theogonia*, a genealogical poem of the creation myth, the generation of the 12 gods cleanse the tradition of supernatural elements that preceded them, signalling the beginning of history. Athena played a central part in the legendary battles. By implication there was an inherent role of Athens, her sacred city, in the defensive struggle for power and universal order (Lagerlöf 2000: 86).
- 10 Claude Levi-Strauss observes that a universal characteristic of men born from the earth in mythology is their difficulty in walking (1963: 215).
- 11 Cekrops, like Erechthonios, is autochthonous, half-man half-snake.
- 12 From 'wool' and 'earth' ('erion' and 'chthón').
- 13 'Remarkable for the noise of waves it sends forth when the south wind blows' (Pausanias xxvi, 5–7).
- 14 According to Herington the reason for the existence of two variants of the patron goddess at the two temple sites is that they stem from different religious traditions, which may have started in connection with different goddesses, one associated with the abundance of the earth and the cultivation of the olive, and the other with the image of the virgin warrior (1955: 45).
- 15 The pediments show the 'beginning' where the gods came into being, lived and existed in their own realm. The metopes corresponded to the heroic period of emblematic wars. Finally, the frieze presented the world of Athenian society where gods had ceased revealing themselves to men. 'But men can seek contact through ritual with their divinities who are no longer directly accessible' (Lagerlöf 2000: 146).
- 16 The eastern part of frieze portrayed gods and mortals joined at the reception of Athena's woven robe ('peplos').

2 Invisible surface

- 1 G was an avant-garde periodical Mies contributed to both as an author and editor. The editorial address indicates that the journal was conducted from his office (Neumeyer 1991: 14).
- 2 'When a work of architecture or art departs from culturally established patterns, it is not enough to see it in order to understand it. A process of collective clarification must take place, meaning has to be verbalized and new interpretive canons are to be set up.' Bonta studied the critical texts on the Barcelona Pavilion to identify the invariants in semiotic interpretations. His comparison of texts showed that there were recurring interpretative approaches (Bonta 1979: 138).
- 3 'There is a galaxy of words and paucity of images that comprise our collective memory of "The Barcelona Pavilion", further complicating its status as the icon of an époque', (Dodds 2005: 3).
- 4 Tafuri and Dal Co used the metaphor of the labyrinth to describe the Pavilion, suggesting that it caused disorientation due to its mirrored surfaces, labyrinthine path and lack of exit (1986: 134).
- 5 Zimmerman sees a corollary between the spatial sequences, the framing strategy in Hans Richter's films and the carefully scripted sequences in Mies' building (2007: 116).
- 6 'The German Pavilion established a gateway between the grandiose, eclectic architecture of the Exposition proper and the picturesque Spanish Village, the Pueblo Español, on the hill behind the German site' (Zimmerman 2001: 236). Mies rejected the site at the bottom of the flight of steps leading to the Palau National offered by the Exposition organizers for the one situated to the south of the plaza. The contrasts between the axial layout and the absence of symmetry in his design suggest that he saw the axis as the backdrop against which he could project the irregularities of the building. As the various versions of the plan show, the position of the rear flight of steps remained always constant in his drawings 'centered in relation to the rear access and occupying

a central position' (de Solà-Morales, Cirici, Ramos 1993: 12). Another contrasting backdrop to the building was provided by the large blind wall of the Palau de Victòria Eugènia (1993: 9).

7 Peter Eisenman explains that in the nineteenth century the French Beaux-Arts thought of the 'marche. It was an axis and [one would proceed along the axis in a sequence]. Le Corbusier reacted against that and ... made a thing he called the promenade architecturale [or swirling motion through space]' (Elderfield 1998a: 52)

8 'Also, the flat slab of the roof [of Crown Hall] induces a certain outward pull; and, for this reason, in spite of the centralizing activity of the entrance vestibule, the space still remains, though in very much simplified form, the rotary, peripheric organization of the twenties, rather than the predominantly centralized composition of the true Palladian or classical plan' (Rowe 1984: 149).

9 Critics have increasingly drawn attention to the fact that very few writers saw the building, and that the majority of the texts has been based on the surviving photographs (Tegethoff 1985: 70; Dodds 2005: 36).

10 'Decomposition remains a substantial invariable of the modern idiom. In the Bauhaus complex in Dessau, for example, Gropius broke up the volume into three distinct units. ... There is no vantage point from which you can grasp the whole. You have to walk around. Hence movement, hence time. ... Mies van der Rohe is perhaps the outstanding exponent of de Stijl. His German Pavilion at the Barcelona Exposition of 1929 is a masterpiece of this architectural trend. It consists of panels in travertine and marble, glass sheets, water surfaces, horizontal and vertical planes that shatter the immobility of closed spaces, break through volumes, and give direction to exterior vistas' (Zevi 1978: 33–5).

11 'It is unexpected because Mies had gotten rid of vertical bilateral symmetry (the kind we expect), making a conspicuous show of its absence. He then reintroduced it, in quantity, in another dimension, where no one would think of looking for it: horizontally. ... For a person of average height, the dividing line between the onyx panels is indistinguishable from the horizon line' (Evans 1997: 258).

12 The study of reflections is based on mapping visual fields through reflective surfaces. This mapping does not take into account variations in light conditions or the physical differences among the various materials.

13 Tegethoff explains that the cost of the material for the onyx wall must have been one fifth of the total cost of the building. Mies tried to make a very economical use of the onyx block and its dimensions (1985: 76).

14 A blueprint made by the company that supplied all of the marble for the project showed that the paving slabs varied at the front right corner of the Pavilion, near the onyx wall, the inner pool and the back connecting wall. Based on these adjustments, Tegethoff concludes that the grid bore no symbolic significance as a universal module (1985: 82).

15 'The figures produced by the onyx, its brilliant, diffuse coloration and its great dimensions – in slabs of 235x155x3 cm – made this naturally rich material a gem which created, perhaps more powerfully than any sculpture, a centre of interest in the flow of circulation through the building's interior (de Solà-Morales, Cirici, Ramos 1993: 14).

16 Asking whether the composition derives from a central scheme with a centripetal focal point Quetglas suggests that the centre exists in the space defined by the onyx wall and the black carpet. This was the area before the two armchairs, which served as thrones for Alfonso Borbón and his wife in the inauguration ceremony (2001: 141).

17 This method is known as 'Visibility Graph Analysis' (Turner, Doxa, O'Sullivan, Penn 2001: 103–21).

18 There are obvious differences between a photograph and a building, while certain effects seen in pictures are often artefacts of photography. The reflections a camera records and those I have tried to represent diagrammatically are in reality variable phenomena depending on different light conditions and the reflective capacity of materials, some of which were different in the original building than in the reconstruction. However, the use of reflecting surfaces in the Pavilion remains

a fact, reflecting what I have mapped, but perhaps with different degrees of intensity at different times of the day.

19 The impact of de Stijl's ideas on the design of the Schröder house is mostly evident in the dissolution of corners that give planar readings to walls and surfaces. More importantly, the sliding panels in the interior transferred the notion of space freed from constraints from the two-dimensional canvas to architecture. But while Rietveld combined the abstract ideals of de Stijl with Madam Schröder's needs for compact living, in the Pavilion Mies faced no functional demands for flowing yet compact space. The decomposition and integration of the volume he created is purely perceptual and aesthetic.

20 Paris Exposition of the Decorative Arts, 1925.

21 'The most important thing can anyway not be discussed', (1962) interview in *Die Bauwelt*, 53: 885. Also see: 'Art works have a life of their own. They are not accessible to all. For them to speak, one must approach them in the way they demand. This constitutes the obligation of the critic', Ludwig Mies van der Rohe (1930), 'On the Meaning and Task of Criticism', *Art Kunstabblatt*, 14(6): 178.

22 Neumeyer explains that 'the aesthetics of analogy pursued by Behrens in the crossing of classical forms with the methods of technical-industrial production appeared to Mies as a signature style method of "form-giving" and therefore ill-suited as a basis for building'. Mies was drawn to Berlage's views of a 'supposedly objective creative truth that must not be understood as form-inventing but as form-finding' (1991: 66). However, Mies was a follower of both architects. On the one hand, he admired Behrens' employment of the new steel and glass in construction, but reacted to the semantic and formal expression of his Turbine factory. On the other, he was attracted to Berlage's view of construction as 'universal lawfulness', an essence devoid of stylistic formalism (1991: 69).

3 'The book and the labyrinth were one and the same'

1 Frances Yates' account of the *Art of Memory* describes the techniques and the philosophy of memorizing that associated ideas with specific places in a building, and in memory machines. Her study moves from ancient Greece and Rome to the medieval and Renaissance occult currents to culminate in Camillo's memory theatre where the whole world can be seen from the vantage point of the stage. 'The art of memory is like an inner writing. Those who know the letters of the alphabet can write down what is dictated to them and read out what they have written. Likewise those who have learned mnemonics can set in places what they have heard and deliver it from memory. For the places are very much like wax tablets or papyrus, the images like the letter, the arrangement and disposition of the images like the script, and the delivery like the reading' (2001: 22).

2 'To use a metaphor devised by Jorge Luis Borges (another spirit who is very much present in these talks and who gave his own Norton lectures twenty-five years ago), a wood is a garden of forking paths. Even when there are no well-trodden paths in a wood, everyone can trace his or her own path, deciding to go to the left or to the right of a certain tree and making a choice at every tree encountered. In a narrative text, the reader is forced to make choices all the time. Indeed, this obligation to choose is found even at the level of the individual sentence – at least, every time a transitive verb occurs. Whenever the speaker is about to end a sentence, we as readers or listeners make a bet (albeit unconsciously): we predict his or her choice, or anxiously wonder what choice will be made ...' (Eco 1994b: 6).

3 Borges, J. L. (2000) *Fictions*, trans. A. Hurley, London: Penguin Books, pp. 106–10.

4 '... the model author acts and reveals himself ... to tell us that the descriptions we are given must be a stimulus for our imagination and for our physical reactions. ... The intervention of a speaking subject occurs simultaneously with the creation of a model reader who knows how to continue the game of inquiry into the nature of games; and the intellectual disposition of this reader (even the urge to play the subject of playing games) is determined only by the type of interpretive

moves that that voice asks him or her to make: to look to see, to consider, to find relationships and similarities. In the same way, the author is but a textual strategy that is capable of establishing semantic correlations and asks us to be imitated' (1994: 17–25).

- 5 Borges, J. L. (2000) *Fictions*, trans. A. Hurley, London: Penguin Books, pp. 75–86.
- 6 Borges, J. L. (2000) *Fictions*, trans. A. Hurley, London: Penguin Books, pp. 111–23.
- 7 Felix della Paolera explains that in *Death and the Compass* Borges creates the appearance of a French city and its suburbs through the use of places such as 'Hotel du Nord', 'Rue de Toulon' and the 'villa Triste-le-Roy', but in reality these stand for locations in his home city, Buenos Aires (2002: 108).
- 8 Whereas in *Ulysses* Joyce has concentrated 24 rhapsodies of the *Odyssey* describing travels through many places in one day and within the perimeter of one city, Borges proposes that Nolan expands a two-hour theatrical play by Shakespeare to take place over a number of days and within many stage settings, the streets of Dublin.
- 9 'We are brought up short, our smooth passage impeded by a little rock. We seem to have taken the wrong turning in a labyrinth. Confusion is deliberately wished upon us. Then we realise that this is no displacement of time, only a mere memory of past sensation. We can go on our way again, but we must remember to go carefully. We must remember also that Joyce is remembering, despite all these perverse-seeming ingenuities, to carry on with his story' (Burgess 1982: 134).
- 10 The affinity in the ideas underlying the English and the Chinese landscapes are reflected in many examples of English gardens, which incorporated Chinese structures, creating what was known as the Anglo-Chinese garden.
- 11 Clemens Steenbergen and Wouter Reh explain that eighteenth-century landscapes were associated with in the paintings of Claude le Lorrain, Nicholas Poussin, Salvator Rosa and Gaspard Dughet, idealizing the Roman landscapes through iconic references in the garden. These references 'were linked with the visual characteristics of the English agricultural landscape, with the expanse of the open fields, the spatial effect of the rolling hills, the winding paths, the northern light and the atmospheric perspective. The last was once described by Siegfried Giedion, after having seen *Simplon Pass*, a painting by Joseph M. W. Turner from around 1840, as 'a humid atmosphere which dematerializes the landscape and dissolves it to infinity' (1996: 249).
- 12 'With the Renaissance revival of the Greek mathematical interpretation of God and the world and invigorated by the Christian belief that Man as the image of God embodies the harmonies of the Universe, the Vitruvian figure inscribed in a square and a circle became the symbol of the mathematical sympathy between the microcosm and the macrocosm. How could the relation of Man to God be better expressed, we feel now justified in asking, than by building the house of God in accordance with the fundamental geometry of the square and the circle?' (Wittkower 1988: 25).
- 13 'By the time we have finished the book [*Ulysses*] they [the characters] have presented us not only with a serio-comic re-telling of the *Odyssey* but also with a complete conspectus of the arts and the sciences, a working model of the human body, a spectrum, and a textbook of literary techniques. These are gifts which we can accept or ignore, just as we wish: they are primarily there in the service of story. As Joyce himself said, they make a bridge for the marching across of his eighteen chapters; when the chapters have achieved their passage the bridge can be blown sky-high. But the bridge is an astonishing piece of pontifical architecture in its own right' (Burgess 1982: 87).
- 14 'Suppose that fragmentation operates now as centrality did in the Renaissance. It would neither reform nor reflect the world as it is. It would instead, rather surprisingly, be offering a presentiment of what the world lacks. So is it the consoling vision of our times?' (Evans 1995: 103).
- 15 Calvino explains that Borges' primary invention was to pretend that the book he wanted to write was written already by an unknown author (1999: 239). The conciseness in Borges' literature is explained by Borges himself in the foreword to his *Fictions*: 'It is a laborious madness and an impoverishing one, the madness of composing vast books – setting out in five hundred pages

an idea that be perfectly related orally in five minutes. The better way to go about it is to pretend that those books already exist, and offer a summary, a commentary on them' (2000a: 5).

16 'Certainly Borges' fabulist narratives have influenced us in showing how he can make philosophical, metaphysical statements while telling a parable' (Eco 2006: 134).

4 (Th)reading the Library

- 1 'A man sets himself the task of portraying the world. Through the years he peoples a space with images of provinces, kingdoms, mountains, bays, ships, islands, fishes, rooms, instruments, stars, horses and people. Shortly before his death, he discovers that the patient labyrinth of lines traces the image of his face' (Borges 2000c: 183).
- 2 Borges, J. L. (2000), *Fictions*, trans. A. Hurley, London: Penguin Books.
- 3 '... language in the cabbala did not represent the world by simply referring to it. It did not, that is to say, stand to the world in the relation of the signifier to the signified or sign to its referent. If God created the world by uttering sounds or by combining written letters, it must follow that these semiotic elements were not representations of existing things, but the very forms by which the elements of the universe are moulded. The significance of this argument in our own story must be plain: the language of creation was perfect not because it merely happened to reflect the structure of the universe in some exemplary fashion; it created the universe. Consequently it stands to the universe as the cast stands to the object cast from it' (Eco 1997: 31).
- 4 'The Reader of [Bruno's] shadows immediately notices the several times repeated figure of a circle marked with thirty letters. In some of these figures, concentric circles, marked with the thirty letters, are shown. ... Paris in the sixteenth century was the foremost European centre of Lullism, and no Parisian could have failed to recognize these circles as the famous combinatory wheels of the Lullian Art. The efforts towards finding a way of conciliating the classical art of memory, with its places and images, and Lullism with its moving figures and letters, had continued to grow in strength in the later sixteenth century. The problem must have excited a good deal of general interest, comparable to the popular interest in the mind of machines of today' (Yates 2001: 206).
- 5 These combinations were formulated independently of whether the resulting sentences made sense, or they could be pronounced.
- 6 Before Guldin, Harsdörfer (1651) wanted to display on five wheels 264 elements that would generate through their combinations 97,209,600 words including those that did not exist. Clavius (1607) also calculated how many words he could produce by combining the letters of the alphabet in twos and threes arriving at words produced by all 23 letters. Mersenne (1636) took into account not only words but also musical sequences. Eco explains that it is these combinatorial speculations that Swift mocks in *Gulliver's Travels* (III. 5), putting forward his universal language (Eco 2006: 106–7).
- 7 The Minotaur was born by the unnatural union between Pasiphae, the wife of King Minos, and a bull and had a man's body and a bull's head (Ovid 2004: 8.151–259).
- 8 The clearest example of a story embedded into another story was in *The Garden of Forking Paths* which refers to the *Garden of Forking Paths*, a book and a garden produced by Yu Tsun, a character in the story.
- 9 This book is the 'perfect compendium of all other books' (Borges 2000c: 71).
- 10 Statements that are paradoxically false and true are equivalent to an ancient paradox in philosophy called the *Epimenides paradox*. Epimenides was from Crete and was said to have made the following statement: 'All Cretans are liars'. The logical consequence from his statement was: 'Epimenides is Cretan and must therefore be lying'. Once this statement is accepted as true, the first statement is immediately cancelled as false. Hofstadter explains that this paradox is a one-step strange loop (2000c: 17).
- 11 'Within any given limited system, there exist entities that cannot be perceived or reached or proved, and we need to move up to a larger system in order to comprehend these entities; but when we do this, we encounter larger systems and entities that lie beyond them' (Aczel 2000: 195).

5 Soane through the looking-glass

- 1 'Soane was the first architect to bring to the world of bricks, mortar and property development the Sturm und Drang of the Romantic Movement, as personified by the painters Henry Fuseli and Benjamin Robert Haydon. Inspired by Rousseau and by Goethe's *Young Werther*, this generation of artists of the 1780s invented the idea that creative genius was identified with uncompromising self-expression – and that the consequence of the refusal to compromise was misunderstanding, persecution and failure' (Woodward 2001: 161).
- 2 Quoted by Watkin: 'Rapport fait par M. Hittorf, sur la Maison et le Musée du Chevalier Soane, architecte à Londres', *Annales de la Société Libre des Beaux-Arts*, 1836, pp. 100–1.
- 3 *Description of the House and the Museum on the North Side of Lincoln's Inn Fields, the residence of John Soane*, London, 1830; 2nd ed. 1832, and 1835.
- 4 'This Description, however, was chiefly written for the advantage of the Architect, who will, I trust, become sensible, from the examination to which it leads him, that every work of Art which awakens his ideas, simulates his industry, purifies his taste, or gives solidity to his judgement, is to him a valuable instructor' (Soane, 'Exordium' 1835).
- 5 The statue was a copy of the original piece moulded for the Earl of Burlington. Dorey writes that 'of all the famous antique statues Soane seems to have singled out three or four for particular attention. He prized his large cast of the Apollo Belvedere, placed symbolically at the centre of the Museum, and later added to his collection a large plaster of the head alone and another smaller plaster model of the whole statue, by Flaxman (1992: 124).
- 6 The purpose of the Pasticcio was 'to demonstrate the universal value of architecture, and point persistently to the duty of the architect who must, in Soane's words, think and feel as a poet, combine and embellish as a painter and execute as a sculptor' (Buzas 1994: 12).
- 7 These lines, known as *axial lines*, are one of the representational tools used by space syntax. Axial lines represent the extension of space in a single direction. They are drawn tangent to surfaces and are relevant to our intuition of space as experienced through sight and movement. The representation of the axial properties of a layout takes place through the 'axial map', the set of fewest and longest possible lines that cover a plan, making all spatial connections (Hillier and Hanson 1984: 92). However, in Figure 5.5 the least set of axial lines is not used but as many as possible in order to expose the multiplicity of visual connections in the museum.
- 8 The Monk's Parlour and Yard were created as monastic stage sets ruins for a fictional hermit, 'padre Giovanni', and satirized the contemporary preference for the Gothic. Soane was satirical

of Gothicism but he incorporated Gothic elements in his design like the canopy separating the Dining Room from the Library and the suspended vaults in the ceiling of the Picture Gallery.

9 After purchasing the sarcophagus in 1824 Soane opened his house to the public over three evenings, inviting the recipients of 900 invitations to see the house and the collections by lamplight. The interior of the sarcophagus was illuminated by candles glowing in the darkness of the Crypt through its thin alabaster walls. Soane's own description of the event reveals his fascination with theatrical effects and spectacular entertainment (Furján 2002: 14). For Lorch the symbolism of the sarcophagus and the tomb is theatrical, engaging 'the artefacts in a dialogue with the occupant/viewer through ritual, use and drama' (1982: 46).

10 The attraction to funereal subjects was common at the time, as many projects of mausoleums and tombs were submitted to the Royal Academy for its regular exhibitions. However, Soane's imagination was captivated by the subjects of decay and death in an obsessive way, fuelled by his disappointments over his dynastic ambitions and the thought that the museum would vanish to oblivion (Feinberg 1979: 103).

11 The three courtyards separating the front from the rear act as interruptions between the contemporary and the past times. In moving between the two states the visitor passes through the Study, the Dressing and the Breakfast Room – 'bridges' that separate and connect at the same time, introducing an element of tension between continuity and discontinuity in the historic procession.

12 The justified graph forms the analytical basis in space syntax through which various spatial characteristics like the property of integration are described (Hillier and Hanson 1984: 147–53).

13 'The front of a building is like the prologue of a play, it prepares us for what we are to expect. If the outside promises more than we find in the inside, we are disappointed. The plot opens itself in the first act and is carried on through the remainder, through all the mazes of character, convenience of arrangements, elegance and propriety of ornaments, and lastly produces a complete whole in distribution, decoration and construction'. Sir John Soane's Museum London Archives 1/2/52, 'Querry 5th lecture (paper watermarked 1808)', quoted by Watkin (1996: 188).

14 The organization of spaces around an imaginary centre was unique to Kent's design. Kent 'discovered the hidden geometric relationship between the various parts of the landscape garden and in doing so made the house, the various garden spaces and surrounding hills parts of a panoramic landscape theatre which also included the observer' (Steenbergen and Reh 1996: 331).

15 The plan to build a gallery for the collection goes back to the days where Soane was living in Pitzhanger Manor. So, the Dome has been always conceived as the structural core of the museum, J. Soane, *Description*, 1835–36, p. [vii].

16 In Soane's *Description* the Dome is reserved for the last stages of the narrative covering the ground floor and the basement. But it is not clear whether this is the way he intended the visitors to access this space. So, it is possible to start the circuit moving from the entrance vestibule or the Dining to the Breakfast Room and access the Dome in this sequence. However, the placement of the Apollo at the end of the east-west axis gives the Dome 'orientation', favouring the frontal viewpoint, although visitors can explore the layout from multiple viewing positions. It seems to suggest that Soane prioritizes arrival to the Dome from the right side of the layout rather than through the Breakfast Parlour.

17 At the time Soane was building in Lincoln's Inn Fields, the mirror was very much in use in a variety of ways, 'pier glasses, overmantel mirrors looking glasses and cheval glasses pilaster insets, door facings, display-case backings, convex mirrors, vista mirrors, catoptric devices, and so on' (Furján 1997: 63). Its primary function in the museum was to enhance illumination in those cases where there were inadequate sources of daylight and candlelight. But, as Furján suggests, what is remarkable is not the various forms of mirrors and their employment but their association with the house and the collection.

18 There are also convex mirrors and a mirror-lined niche in the vestibule hall, mirror strips in the anteroom between the Breakfast Room and the museum area, a large convex mirror in the north-

wall recess of the Egyptian Crypt, a large panelled mirror on the north wall of the Monk's Parlour, one in Soane's bathroom, and mirrors constructing playful effects with the busts of Palladio and Inigo Jones in the Dressing Room.

19 Furján writes that by the end of the seventeenth century the word reflection in English came also to mean an operation of the mind. John Locke's idea of the thinking apparatus as a mirror demonstrates that he took note of this shift of meaning. By the early nineteenth century the mind was thought of as a mirror of nature. 'By the time of Soane's death, in the 1830s, the figure of the mirror no longer simply allowed nature to be mimetically and directly passed through the mind's eye and into its created representations, but admitted of mediation, imagination, and abstraction' (1997: 72).

20 Soane's elder son had health problems and went through unsuccessful architectural training in Liverpool. The younger son, George, was determined to be a playwright and published two articles criticizing the architecture of Soane in a London newspaper. Soane's wife died six weeks after the publication, while Soane and his son did not speak to each other again (Woodward 2001: 173). These events and the disputes with the Royal Academy over his position as a professor, and with the District Surveyor over the projecting loggia at the front of the house, become apparent in the *Crude Hints*, in which Soane expresses an almost paranoid resentment: '... then persecutions and other misfortunes of a more direct & domestic nature preyed on his mind – he saw the views of early youth blighted – his fairest prospects utterly destroyed – his lovely character became sombre – melancholy, brooding constantly over an accumulation of evils brought him into a state little short of mental derangement, his enemies perceived this – they seized the moment – they smote his rock & he fell as many had done before him and died as was generally believed of a broken heart' (Dorey 1999: 55).

21 There are also representations of the museum in the museum, as in Gandy's subliminal paintings of its various spaces that hang in the Picture Gallery. Further, there are depictions of other architectural works by Soane, as well as objects and elements showing architectural motifs he used in a number of projects. A characteristic painting by Gandy in the Gallery depicts a set of his buildings in a large space crowned by a typical Soanian ceiling, the shallow dome. Other examples are Gandy's aerial cutaway view of the Bank of England depicted in ruins, and a panorama of unrealized projects entitled *Architectural Visions of Early Fancy and Dreams in the Evening of Life*. The multiple instances of self-representation through the portraits of architects and artists, the examples of representation of his own architecture, and his fascination with ruins and death would seem to suggest his preoccupation with himself and his position in the history of architecture.

22 The Yard is a Gothic cloister and contains a tomb with the inscription: *Alas Poor Fanny!* Fanny was Mrs Soane's pet dog buried in the Monk's Grave. Soane was satirizing the contemporary interest in the Gothic, but he was also expressing his sadness over the death of his wife after which he lived for 20 years alone in the house. The hermit in the cell 'became an *alter ego* for the lonely old architect' (Woodward 2001: 169).

23 'The Pantheon in Rome is another example of the hylaethral temple. This stupendous structure, though stripped of its precious ornaments, and despite all the alterations it has undergone, is yet the most perfect and magnificent temple now to be seen'. There is also another species of temple, Soane wrote, 'called hylaethral, sacred to Jupiter, to the Sun and to the Moon. These temples have peristyles externally and eternally. The space between the internal peristyles was left open at the top because the ancients judged it highly improper to confine those divinities within walls' (lecture III), (Watkin 2000: 74–5). So, the Colonnade, the position of Apollo at the end of the axis, and the Dome, lit by natural light from the top, construct a hybrid typology between the Pantheon and the ancient Greek hylaethral temple.

24 Calasso refers to the dialogue quoted in Herodotus between Croesus, the king of Phrygia, an ancient country in Asia Minor, and Solon, the chief legislator in Athens who left on a 10-year journey, having an oath from the Athenians that they would commit to maintaining the laws. Croesus wants Solon to recognize him as the most powerful and happiest of men. Solon's response was

in citing an unknown Athenian as an example of a happy man who died old in the battle. 'Solon doesn't mean to contrast, the common man with the king. That would be banal. He is explaining the Greek paradox as far as happiness is concerned: that one arrives at it only in death. ... Never has such an effective circumlocution been found for telling a truth that, if told straight, would be too brutal, and perhaps not even true anymore: that happiness does not exist' (1994: 160).

6 Victorian knowledge

- 1 Bennett explains that the shift of emphasis from the 'exotic' treasures of the cabinets of curiosity to the normal and the commonplace 'entailed a new concern with the general communicability of this knowledge in order, through its effective dissemination, to allow it to be put to useful effect in the productive exploitation of nature. There was also a changed orientation to the visitor – one that was increasingly pedagogic, aiming to render the principles of intelligibility governing the collections readily intelligible to all and sundry, as contrasted with the sensitive and cultic knowledge offered by the cabinet of curiosity' (1995: 41).
- 2 In 1851 the British Museum became crowded with visitors, with over two million of them visiting London for the Great Exhibition. According to Thacray and Press, 'Natural history as a whole had become enormously popular with the general public, and the British Museum was reaping the reward. ... Over a fortnight it was found that as many people were crowded into the natural history galleries as were to be found in the whole of the rest of the British Museum. The authorities accepted that the museum had a twin purpose: instruction for serious academic people, and rational amusement for the masses' (2001: 48).
- 3 The concentration of national institutions in this area was part of an imperial scheme reflecting the belief that museums and universities, dedicated to the production of knowledge and education, should be located close to each other (Forgan 1994: 142).
- 4 'And since, according to the South Kensington philosophy at this time, improved standards of manufacture would be achieved by educating both workmen and manufacturers in matters of taste and the proper application of manufacturing processes, it was important that they should be able to see examples of "good design" and craftsmanship. Furthermore by handling and seeing machines used in manufacturing processes, they would be able to enlarge their knowledge of craft processes and enrich that store of workshop knowledge which historians of engineering education have noted as such a powerful cultural force. The early collections of the Royal Museum of Scotland were devoted to building up such a collection of working machinery showing manufacturing processes in various industries' (Forgan 1994: 146).
- 5 Visitor studies conducted on both museums by the author and the late Tad Grajewski confirmed the vast popularity of both institutions and the high frequency in which they are visited by the public.
- 6 The public was considered to consist of the 'local collector of birds, bird-eggs, shells, insects, fossils, etc. – the intelligent wageman, tradesman, or professional man, whose tastes may lead him to devote his medium of leisure to the pursuit of a particular branch of Natural History' (Girouard 2002: 13).
- 7 Ironically, the new museum would replace Fowke's Exhibition building on Cromwell Road, which the public disliked (Sheppard 1975: Vol. 38: 203).
- 8 Owen and Waterhouse worked together to produce these designs that would supplement the instructive properties of the exhibits (Girouard 2002: 57).
- 9 Owen supplied the material for the decorations, while Waterhouse prepared the drawings. Waterhouse was an enthusiastic supporter of Gothic Revival and of the writings of Pugin, Scott and Ruskin. For Mark Girouard, in his drawings for the terracotta ornaments, Waterhouse used much of his 'frustrated energy as an artist'. In his use of ornament he expressed his Ruskinian influence, combining different colour materials to make patterns of different colours, raising the building to the status of architecture by using sculpture decorations which were instructive of the buildings' content. 'So, over his [Waterhouse] iron framework he stretched a covering of terracotta,

ornamented with birds and beasts, living and extinct, and coloured in a ravishing combination of fawn and pale blue-grey. Above his symmetrical façades he carried his buildings up to the skyline with towers, spires and pinnacles. And he made arriving, entering and exploring the museum as exciting as possible' (Girouard 2002: 36).

- 10 '... and being impressed with the belief that the study of what are called the "Fine Arts" is eminently conducive to the elevation and refinement of all classes, as well as intimately connected with the manufacturing and mercantile prosperity of the community – from these various motives, and on account of my long connection with Glasgow and its various public bodies, ... I [McLellan] have resolved to devote my said Collection to public use and exhibition ...' (Paton 1911: v).
- 11 By the time the display was transferred to the Kelvingrove museum, Glasgow had become an important European centre of artistic movement, while its municipal collection was among the finest and most widely representative ones in Britain (Power 1951: 13).
- 12 Anecdotally, the building was known as having its two entries wrongly placed, with most visitors arriving through the south side.
- 13 'Nomenclature was the crux, the binomial system, soon to be extended to zoology, by which the substantive denotes genus and adjective species. ... The forget-me-not of England, the *oreille-de-souris* of France, the *Vergissmeinnicht* of Germany, became the *Myosotis palustris* of science' (Gillispie 1990: 171).
- 14 'Transpatial' is a term introduced by Hillier and Hanson, describing entities that operate over and above spatial relations across distance (Hillier and Hanson 1984: 20).
- 15 The r-square value in a correlation indicates the extent to which two measures vary in relation to one another. A high r-square value indicates a good correlation between the two measures, as opposed to a low value showing a poor relationship.
- 16 Peponis and Hedin suggest that objects in the Birds' Gallery were synchronized over and above their positions on the classification table, which were non-interchangeable. The arrangement thus became symbolic, allowing knowledge to operate as a map (1982: 23).
- 17 Thackray and Press explain that although the Index Museum was intended to be the epitome of the museum, the reality was rather different. Neither Owen nor the later directors were really interested in creating exhibits for those visitors without the necessary knowledge. The bays flanking the Hall contained detailed descriptions of animals, while the large central space had to be filled initially by a sperm whale, later by elephants and most recently by the great *Diplodocus cernegii* cast (2001: 95).
- 18 Kerr believed that a lightly framed exhibition style building with large top-lit galleries would affect the meaning of the scientific objects, reducing a museum for science to a world fair as a place of spectacle and commodification (Yanni 1999: 124).
- 19 'This paradox (science versus spectacle) dates at least as far back as the invention of taxidermy in the eighteenth century – an invention that served two distinct purposes: some specimens were mounted for aesthetic enjoyment as household objects and trophies, while others were stuffed and kept in cabinets for scientific scrutiny' (Yanni 1999: 149).
- 20 The Art Gallery and Museum, Kelvingrove, undertook a plan for complete restoration of the building in 2001. Display space was increased by the removal of offices and workshops, the opening of the basement and the use of off-site storage facilities. Additional display space was created to accommodate an increase of the number of objects by 50 per cent. Grajewski and Psarra carried out an analysis of the building layout, visitor surveys and a study of the patterns of movement and use by visitors. The results of the study contributed to a new organization of the displays. The curators divided the building vertically with one wing devoted to expressive arts and the other to people and the environment (Psarra and Grajewski 2002b: 42; www.glasgowlmuseums.com).
- 21 A similar study like the one conducted in the Kelvingrove took place in the Natural History Museum in two stages (2001, 2002). The purpose was to identify the ways in which the building worked and contribute to the strategies towards a new master plan for the Museum (Psarra 2005: 87).

7 Contemporary experience

- 1 William Burrell left his collection to the city of Glasgow together with funds to build a gallery. This would house the collection in the Scottish countryside not less than 16 miles from the centre of the city and within 4 miles from Killearn. In 1966 Pollock House and Estate on the southern outskirts of the city were presented to Glasgow. An architectural competition attracting 242 entries took place in 1970. The winning scheme by Gasson, Meunier and Anderson was finally built in 1983 (www.oxforddnb.com/public/dnb/32196-article.html).
- 2 A photographic juxtaposition published by the architects suggests a relation between the top-lit shafts, rock formations, and the narrow streets of historical Edinburgh. Wilson, S. C. S. J. (ed.), *Museum of Scotland*, London: August Media in association with Benson + Forsyth, pp. 78, 79, 123.
- 3 Gasson writes that the 'walk in the woods' was a way of 'making the grass, the trees, the woodland plants, the bluebells and bracken a context for the display of the collection' (1985: 16).
- 4 Soane's influence is evident not only in the treatment of light and space, but also in the close integration of the design with the displays. But as Richard Murphy suggests, the building has influences from the architecture of Mackintosh, Le Corbusier and Scarpa (1999: 25).
- 5 On entering the Burrell visitors have a choice to turn right, accessing the displays through the south part of the layout. However, a study of the visitors' movement conducted by the author (2002) found that most of the viewers (65 per cent) approach the exhibition area through the northern side and exit the museum through the glazed route at the south side.
- 6 The Project Office, National Museums of Scotland, June 1996.

8 Tracing the modern

- 1 Kantor explains that the exhibitions *Cubism and Abstract Art* and *Fantastic Art, Dada, Surrealism* organized by the Museum in the 1930s were set in the tradition of academic scholarship accompanied by documentation. They had a large influence on criticism into the 1960s, 'setting the terms for discussion in the formalist focus of the critic Clement Greenberg, and surviving with provocative concepts for the diverse criticism that developed in the 1970s' (2002: 314).
- 2 Pocantico Conference: Building the Future, 'Building the Future: Museums of Modern Art in the Twenty-first Century', opening remarks by Glenn D. Lowry, Director, The Museum of Modern Art; Kirk Varnedoe, Chief Curator, Department of Painting and Sculpture (Elderfield 1998a: 30–3).
- 3 Soon after the founding of the painting and sculpture departments, Barr established the department of architecture – the first of its kind, which 'exerted a more active, tangible, and salutary influence in its work than any other department'. Barr to Stevens, 16 November 1938. Notes for the reorganization committee, MoMA Archives, NY: AHB, 12.II.3.a. (Kantor 2002: 242).
- 4 In his foreword to the 1932 exhibition catalogue Barr explained that the labelling of the style was the result of its 'simultaneous development in several countries and its worldwide distribution'. Barr, A., Foreword to Hitchcock, H-R., Johnson, P. and Mumford L. (1932), *Modern Architecture: International Exhibition*, New York: The Museum of Modern Art, New York, p. 13.
- 5 Barr, A., Foreword to Hitchcock, H-R., Johnson, P. and Mumford L. (1932), *Modern Architecture: International Exhibition*, New York: The Museum of Modern Art, New York, p. 12.
- 6 In the media of photography, film, video, prints, drawings and illustrated books, painting and sculpture, architecture and design.
- 7 This project was conducted by the author in collaboration with Jean Wineman, Ying Xu and Ipek Kaynar.
- 8 'Heterotopic' refers to the 'coexistence in one building of distinct types of spaces, characterized by subjective differences rather than utilitarian categories' (Riley 1998b: 119). Riley explained that the notion of a heterotopic building corresponds to the status quo of the museum consisting of entirely different environments, from the 'white box' environment of the galleries to the 'black box' of the lecture theatres, and to the multiple art-environments constructed by artists that produce installation art.

- 9 In *Cubism and Abstract Art* Barr observes that the free-standing surfaces of Mies sliding out from beneath the roof have a formal and conceptual resemblance with van Doesburg's paintings developing outwards from a centre. In *Transparency: Literal and Phenomenal* Rowe and Slutsky suggest that Gropius' Bauhaus building adopts a literal transparency based on the natural properties of glass (1984: 171). In contrast, Le Corbusier's Villa Stein makes use of a perceptual or phenomenal transparency based on layered stratification (1984: 168).
- 10 The windows that perforate the outer walls of the building affect the placement of the surfaces enclosing the central space. In this way, orientation is possible through the visual contact between the atrium and the outside.
- 11 The role of the urban grid as a network shaping a pattern of movement has been explained by space syntax which studies buildings and cities as networks of morphological relations connecting to the ways in which people move inside them (Hillier 1996: 161).
- 12 The subsidiary rooms at the south side are also well integrated, but there is a larger coverage of the main sequence by integration.
- 13 Elderfield suggests that Barr 'inherited the formalistic context of Fry and the Bauhaus, which shaped the institution. And Barr's obsession with genealogy is simultaneous with the so-called neo-Darwinian Modern Synthesis of 1930s and 1940s paleontology which combined Darwinism and Mendelian genetics to offer the view of a single evolving human lineage' (2004: 25).
- 14 'How the works were sequenced would be the means to that understanding; how insistently they were sequenced would determine its level of emphasis within the interpretive experience.' Barr's historical arrangement, mainly by stylistic groupings, was therefore subjective, 'a specialized sort of thematic installation'. Elderfield introduces a distinction between a historical and a chronological installation, explaining that the latter is equivalent to medieval annals arranging everything in precise date order through 'unedited objectivity'. Historical installations like Barr's 'merely disguise the fact that they too comprise sets of juxtapositions put together to elucidate subjective interpretations of the subjective reality of the works of art' (2004: 47).
- 15 By accentuating chronological order Varnedoe's broke down the completeness of Barr's history, which divided art works into irreconcilable camps. Barr's history implied that the narrative was found in the works of art rather than placed there by narrative techniques, allowed works of art to be seen less real than ideal, and was dominated by an 'overemphatic narrative drive', disguising reality through a face of regularity and order (Elderfield 2004: 54).
- 16 The opening gallery is descriptive of the longest period (20 years) representing Cézanne, the Post-Impressionists and the Fauves. The shortest time period is in the gallery presenting Pop Art (gallery 23).
- 17 'Pocantico conference – conversation II', in Elderfield, J. (ed.) (1998) *Imagining the Future of the Museum of Modern Art*, New York, New York: The Museum of Modern Art, New York.
- 18 Picasso's classical period with *Three Women at the Spring* followed by five paintings by De Chirico are placed on the west side. On the east side of the room is Picasso's *Three Musicians* and *Guitar*, a late Cubist painting by Gris.
- 19 It is important to stress that this placement of art works described in this chapter was characteristic of the installation during the time of this study (October 2005). Since then some of these exhibitions have shifted as the museum follows a new tendency to rearrange the permanent collections as in the case of temporary exhibitions. For example, the display in gallery 8, which at the time of this study was devoted to Dada, Constructivism and Suprematism (October 2005), was re-installed as a gallery devoted to Bauhaus (Spring 2007).
- 20 These are remarks by K. Varnedoe in Elderfield, J. (ed.), (1998), *Building the Future: Museums of Modern Art in the Twenty-First Century*, New York: Museum of Modern Art.
- 21 The axial placement of art works makes them landmarks of periods or styles that inform the experience at a large scale. By being axially placed they can be seen from the depths of the enfilade sequence, encouraging the viewer to engage in comparisons and approach them from distance. They also emphasize their capacity to act as the MoMA's signature pieces.

22 However, as the method of organization is partly based on chronology, partly on historical periods and styles, the relationships among works of similar sensibility tend to reinforce each other rather than destabilize their established readings. It is important to clarify that the multi-directional links occur only at the north and the south part of the layout, so that the informal multifaceted relationships are limited among temporally co-existing works, rather than works that are separated by large chronological difference.

23 The comparison between the two artists has been the subject of many exhibitions, scholarship and research. The most recent exhibitions were hosted in Tate Modern in London (2002), and the MoMA (2003).

24 It is important to note that of those visitors entering from the south entrance on the fifth floor only 50 per cent continue the exploration in the reverse chronological order. The rest of the people retrace their steps, exit the galleries and re-enter through the north side.

25 This observation is based on the difference in the standard deviation of the number of rooms that paths crossed on each floor level (7.41 on the fifth floor as opposed to 3.79 on the fourth level).

26 We can deduce that Picasso's *Les Demoiselles d'Avignon* (gallery 2) and Monet's *Water Lilies* (gallery 9), which attracted high rates of viewing, play a strategic role in attracting people out of the primary sequence to the peripheral spaces.

27 As Elderfield suggests, the Bauhaus shaped the institution (see note 12). Fiedler explains that Gropius gave his vision the programmatic title of 'Bauhaus' to indicate it was 'synonymous with wealth of ideas, painstaking execution and the ability to adapt to the builder's new methods. A house provides a meaningful location for the communal development of ideas about the shape to be given to life and the outside world, and itself stimulates constant reflection regarding its own reflection and rebuilding' (Fiedler 1999: 10).

9 Comparative discussion

- 1 Pythagoras is associated with the discovery of a correspondence between the first natural numbers, 1, 2, 3, and 4, summing 10, and the basic harmonies of Greek music (Padovan 1999: 64). These discoveries built evidence of a universal significance of simple ratios constructing a link between music, mathematics and nature.
- 2 The difference between ideas and the observable world is a recurring idea in Plato's work most characteristically expressed in the *Republic* through the 'Simile of the Cave'. Humans are compared to prisoners chained in a dark cave from birth. They see only the dark shadows of objects projected on the wall by the light of a fire behind them, misinterpreting these shadows for reality (Plato 1987: 255–64).
- 3 'Which of the two models did the maker use when he fashioned it? Was it the one that does not change and stays the same, or the one that has come to be? ... This, then, is how it has come to be: it is the work of craft, modelled after that which is changeless and is grasped by a rational account, that is, by wisdom' (Plato: 29a), in Zeyl (2000: 14).
- 4 In Zeyl (2000: 13).
- 5 The architect must have regard to 'durability, convenience and beauty' by establishing a standard geometrical module that can in turn be adjusted to the particular requirements of site, climate and function.
- 6 Perrault's questioning of the Vitruvian canon as the correct system of proportions resulted in the loss of absolute principles in architecture. Noticing the disagreements of various authors on the correctness of the proportions of the orders, Perrault invented a new system refuting an age-old belief that classical rules were objective expressions of a universal order (Gelernter 1995: 144, Evans 1995: 269, Pelletier 2006: 12). Authors of architectural treatises continued to acknowledge Vitruvian principles, but they felt the need to respond to the growing importance of convention (Pelletier 2006: 17).
- 7 The theory of expression was a result of a new interest in the shared conventions of architecture as an expressive language as opposed to meaning previously founded on universal harmony. This

theory demonstrated close affinities between architecture and the art of theatre. For Blondel the relationship between the exterior and the interior decoration demanded a unified intention and a progression comparable to a sequence of theatrical scenes. A visitor to the building should observe 'a coherent composition unfolding in front of his eyes' (Pelletier 2006: 18). Le Camus de Mézières believed that the characterization of space should represent the owner's personal story, influencing subsequent generations of architects like John Soane. Previous architectural theories used proportions and classical orders to convey meaning. Le Camus' treatise is instead a room-by-room description of a building, emphasizing the importance of spatial narrative. 'This desire for narrative cohesion came from a need to substitute the principles of cosmic harmony that had guided classical architecture until the end of the seventeenth century.' It required an embodied observer establishing 'a great emphasis on the beholder and the senses' (2006: 22–3).

8 Schmarsow's suggestion that 'the history of architecture is the history of the sense of space' is the clearest demonstration of the rising significance of space as an object of inquiry (1994: 296).

9 Space syntax was initially developed at University College London in the 1970s. Since then it has expanded through programmes of teaching and research worldwide.

10 The work of Peponis (1997b), Peponis, Wineman, Rashid *et al.* (1997) and Peponis and Bellal (2005) was an attempt to introduce the formal properties of built shape into the syntactic analysis of buildings. Starting from the observation that physical elements like surfaces stay constant in visual fields or disappear as we move and change places, Peponis and his colleagues developed tools to represent and measure patterns of *information stability*. Observing the role of boundaries in linking spaces (Psarra 1997a, 1997b), we proposed elsewhere an analysis of shape as a conceptual and perceptual entity, applying syntactic measures on shape perimeter (Psarra 2003b, Psarra and Grajewski 2001).

11 In the design of the Park de la Villette the grid of points became a dense system of signification to express its resistance to a number of pragmatic and compositional demands, functional, contextual, realistic, political, economic, historical and stylistic (Tschumi 1999: 194–6). In spite of the intention to resist dominant oppositions, each of the meanings attributed to the grid articulated a contrast between a new meaning and the one it was replacing: abstract and real, natural and artificial, historical and a-historical, finite and infinite, authoritarian and democratic, signifier and signified, complete and incomplete, coherent and incoherent and so forth.

12 Eco explained that a work of art is a complete and closed form in its uniqueness as a balanced organic whole, while at the same time constituting an open product on account of its susceptibility to countless different interpretations, which do not impinge on its unadulterable specificity. However, some works are 'open' in a 'far more tangible sense ... The author seems to handle them ... more or less like the components of a construction kit. He seems to be unconcerned about the manner of their eventual deployment'. The open work invites us to consider why the artist works in this kind of direction, or try to understand what evolution of aesthetic sensibility led up to it and how it was reinforced by factors in modern culture (1989: 4).

13 Suggested by Robey in the introduction to Eco, U. (1989), *The Open Work*, p. x.

14 The relationship between museum layout, exhibition arrangement and visitors' movement has been explored elsewhere by various authors. (See note 4, Chapter 1.) Among these authors Tzortzi offers an investigation of the conservative and generative model of space in the context of paired comparisons of art museums from the twentieth century (2003, 2004, 2005 and 2007).

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